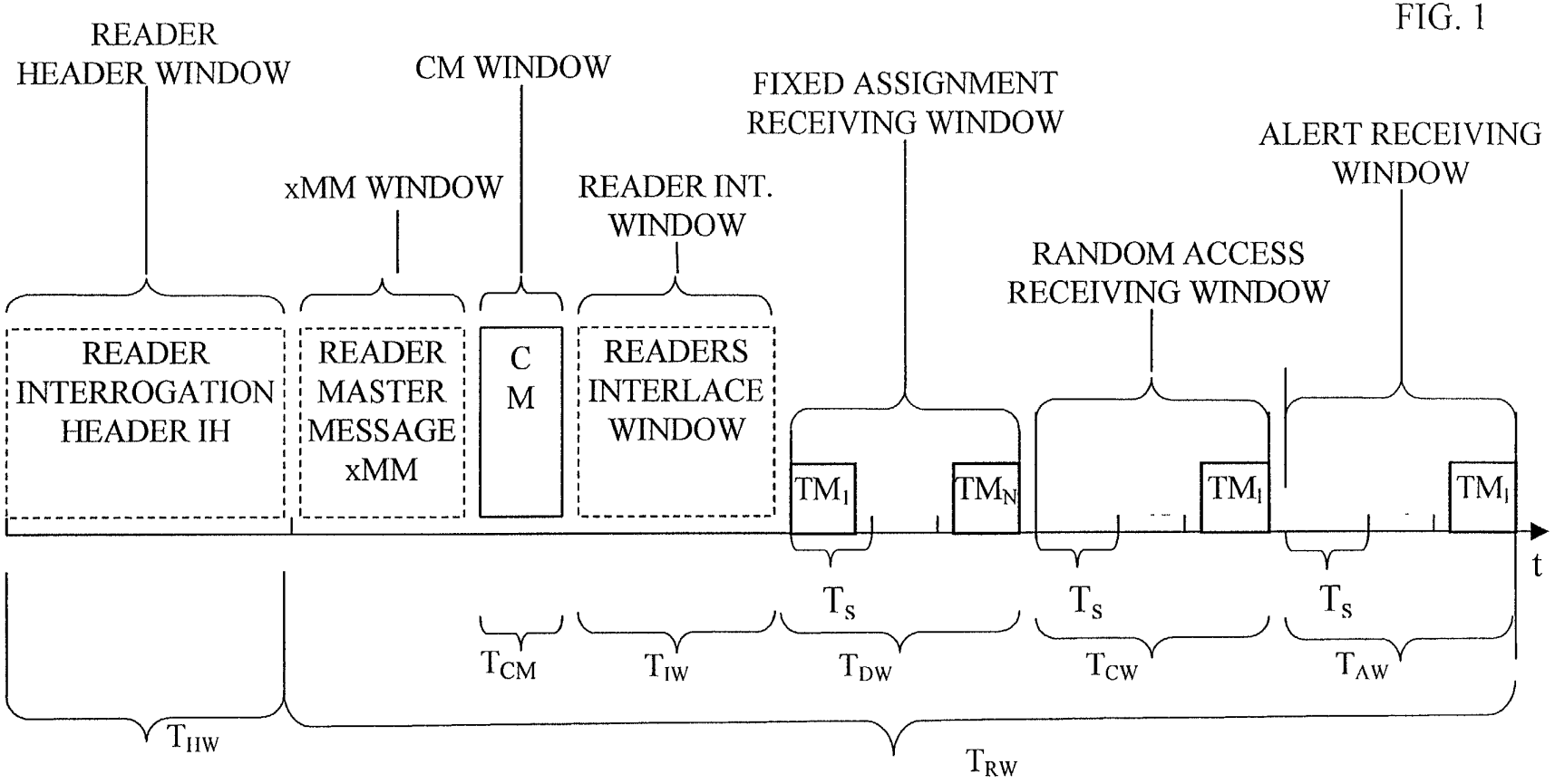
FIG. 1


READER HEADER WINDOW
CM WINDOW
FIXED ASSIGNMENT RECEIVING WINDOW
ALERT RECEIVING WINDOW
xMM WINDOW
READER INT. WINDOW
RANDOM ACCESS RECEIVING WINDOW
READER INTERROGATION HEADER IH
READER MASTER MESSAGE xMM
C M
READERS INTERLACE WINDOW
TM1
TMN
TM1
TM1
t
Ts
Ts
Ts
TCM
TIW
TDW
TCW
TAW
THW
TRW

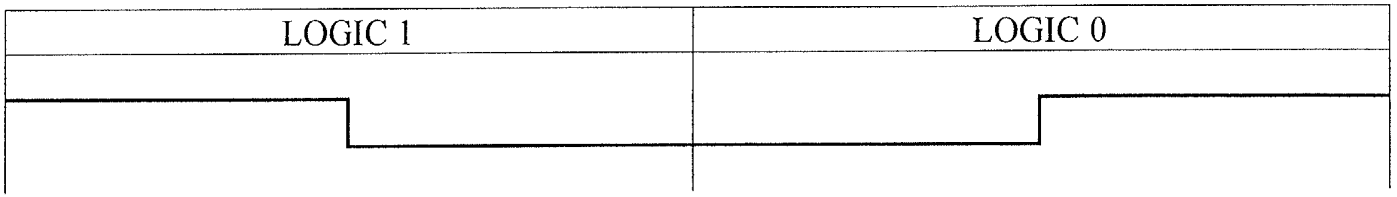


FIG. 2

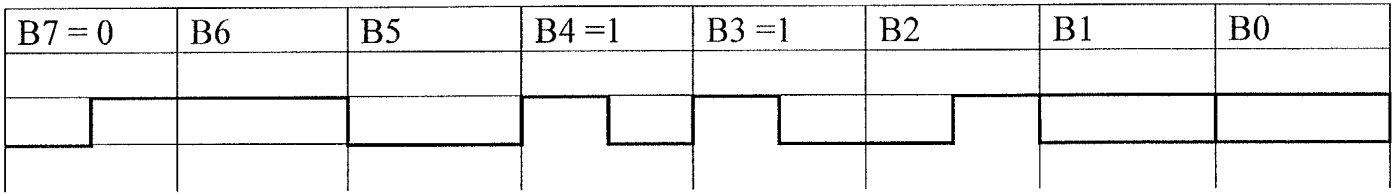


FIG. 3

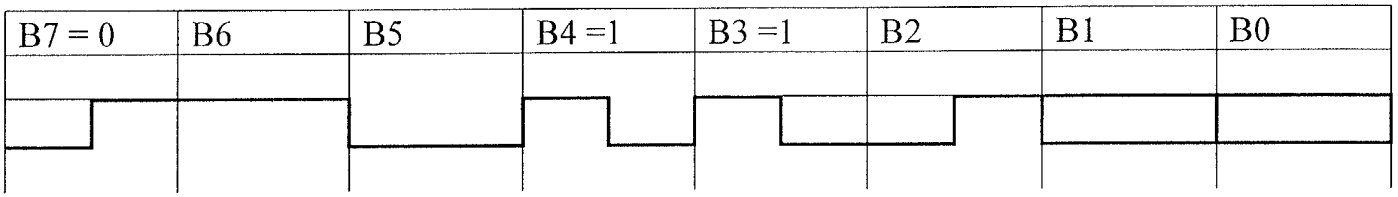


FIG. 4

SYNTAX	DESCRIPTION	B6&B5	B1	B0
FSH	READER HEADER SYNCS	LOW	0	0
FSEH	READER END HEADER SYNC	LOW	0	1
FSBMM	READER BROADCAST MESSAGE SYNC	LOW	1	0
FSAMM	READER ADDRESSED MESSAGE SYNC	LOW	1	1
FSSM	TAG RESPONSE SYNC	HIGH	0	0

FIG. 5

FIG. 6

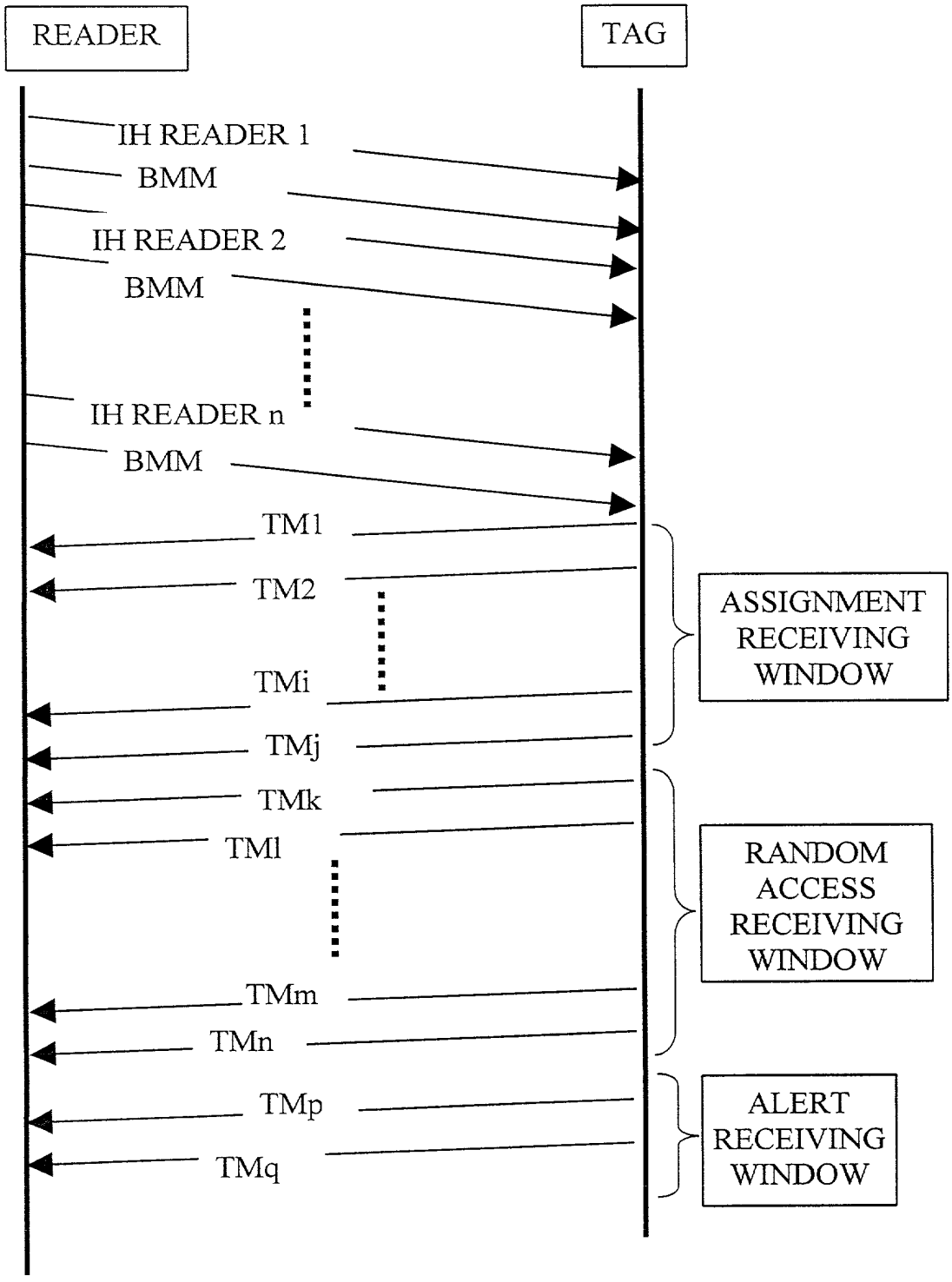

READER
TAG
IH READER 1
BMM
IH READER 2
BMM
IH READER n
BMM
TM1
TM2
TMi
TMj
TMk
TMl
TMm
TMn
TMp
TMq
ASSIGNMENT RECEIVING WINDOW
RANDOM ACCESS RECEIVING WINDOW
ALERT RECEIVING WINDOW

FIG. 7

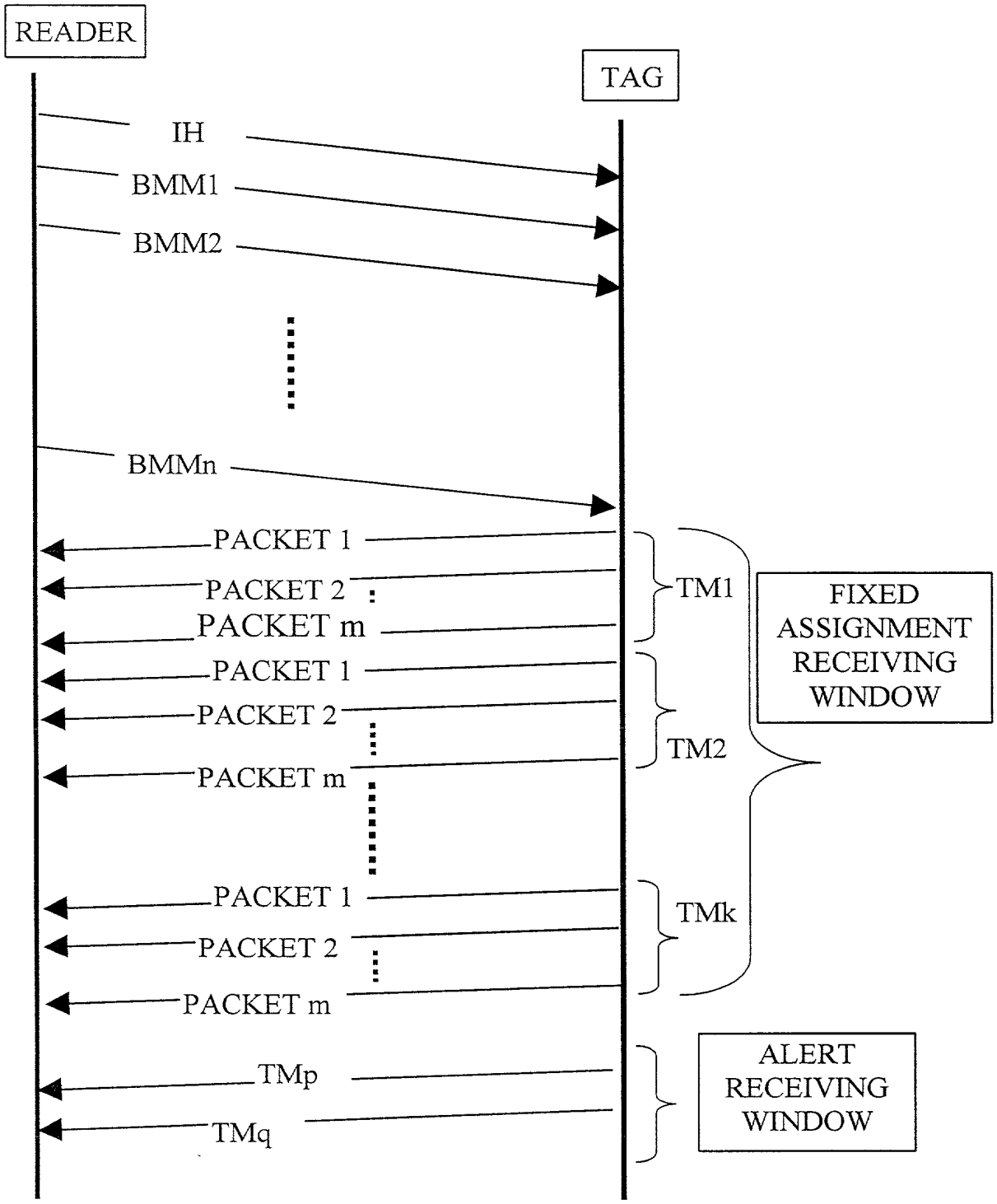

READER
TAG
IH
BMM1
BMM2
BMMn
PACKET 1
PACKET 2
PACKET m
PACKET 1
PACKET 2
PACKET m
PACKET 1
PACKET 2
PACKET m
TMp
TMq
TM1
TM2
TMk
FIXED ASSIGNMENT RECEIVING WINDOW
ALERT RECEIVING WINDOW

FIG. 8

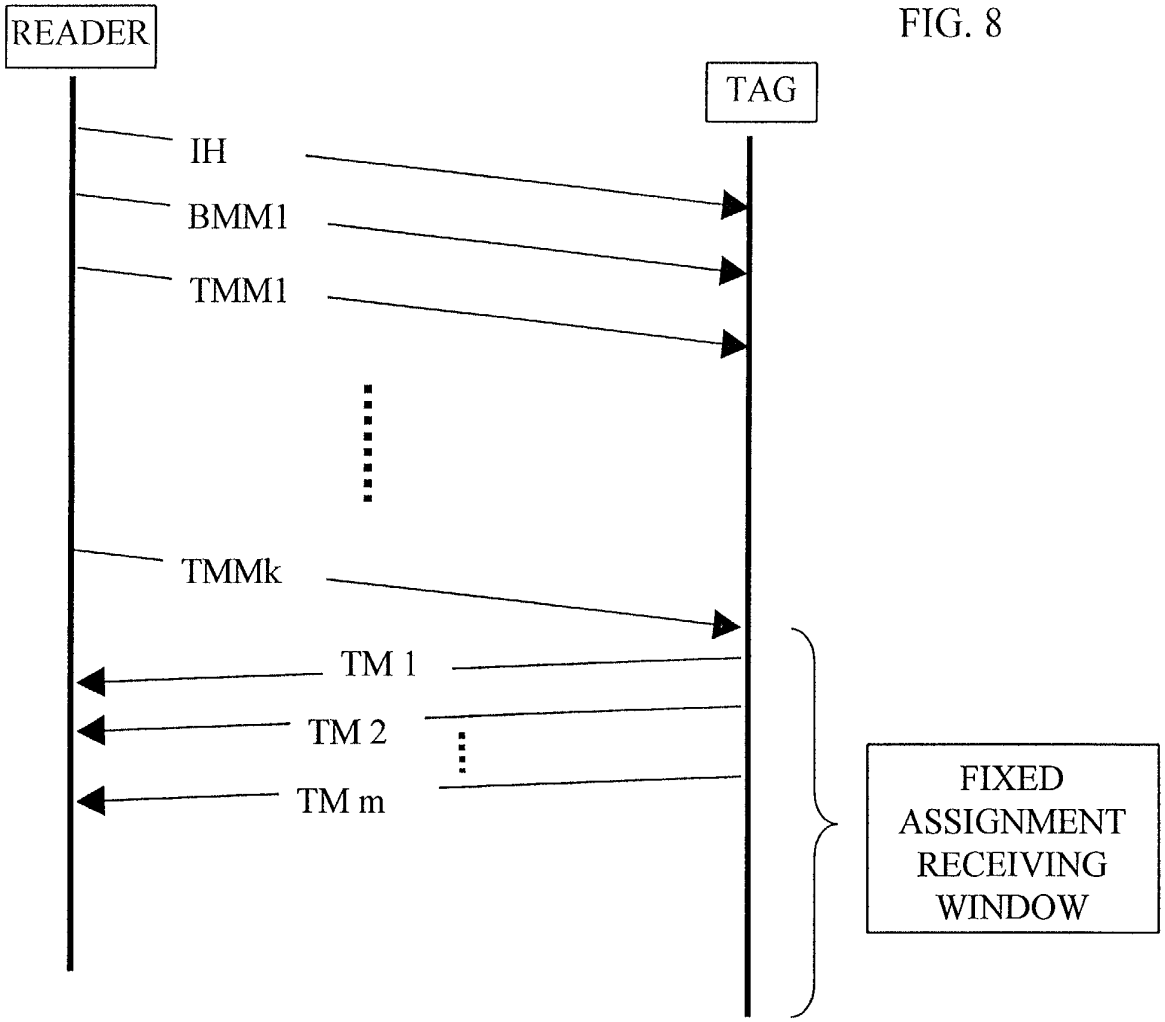
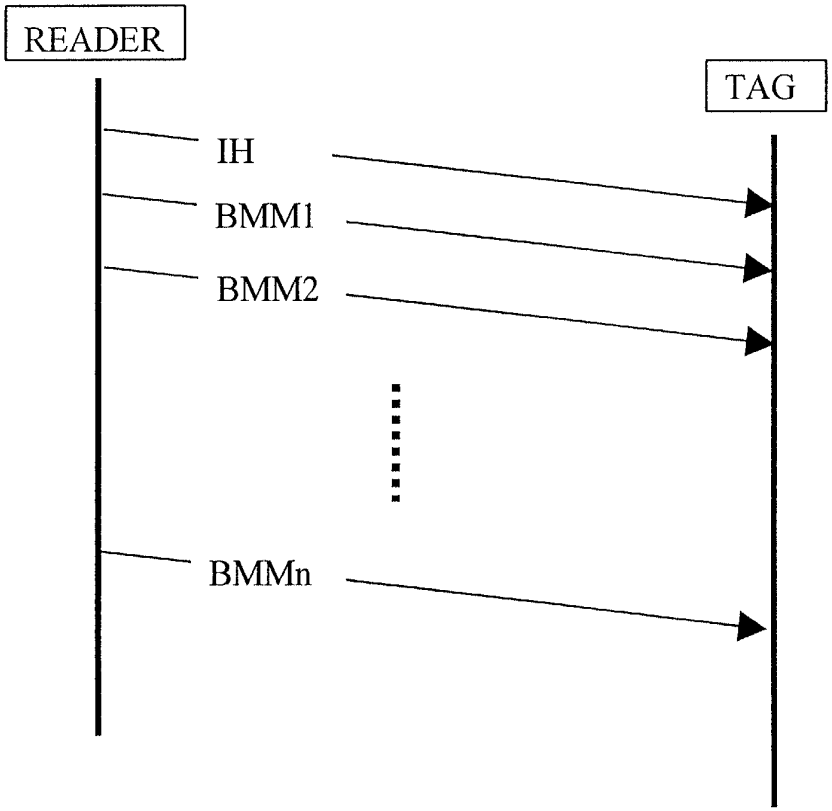

READER
TAG
IH
BMM1
TMM1
TMMk
TM 1
TM 2
TM m
FIXED ASSIGNMENT RECEIVING WINDOW

FIG. 9



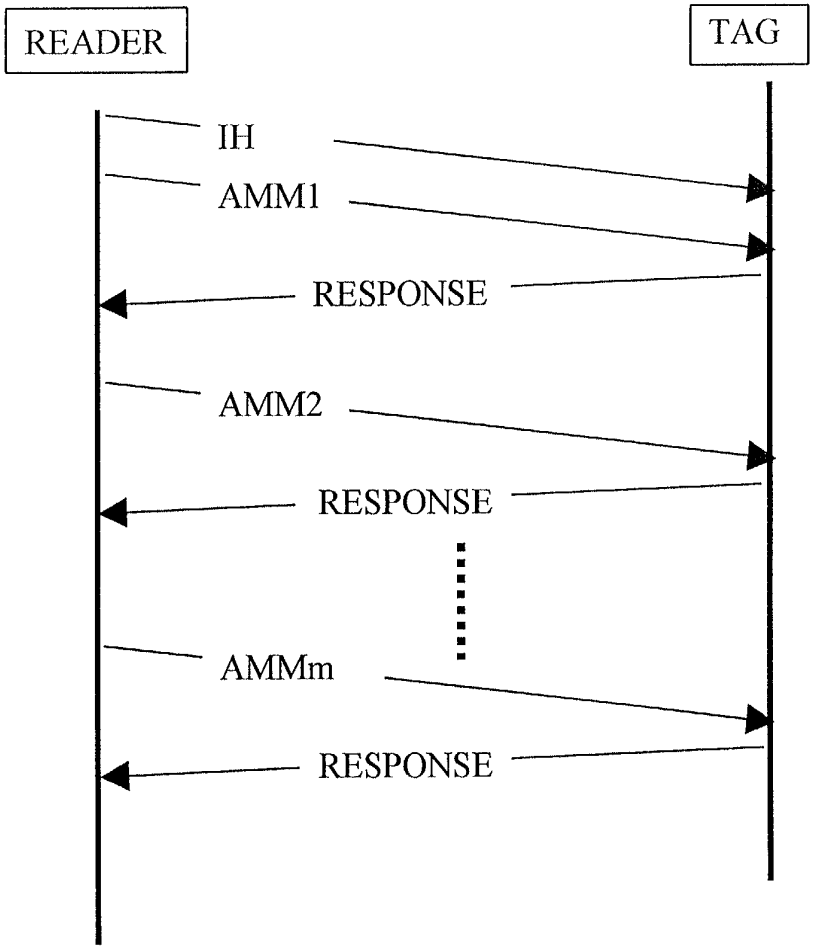


FIG. 10

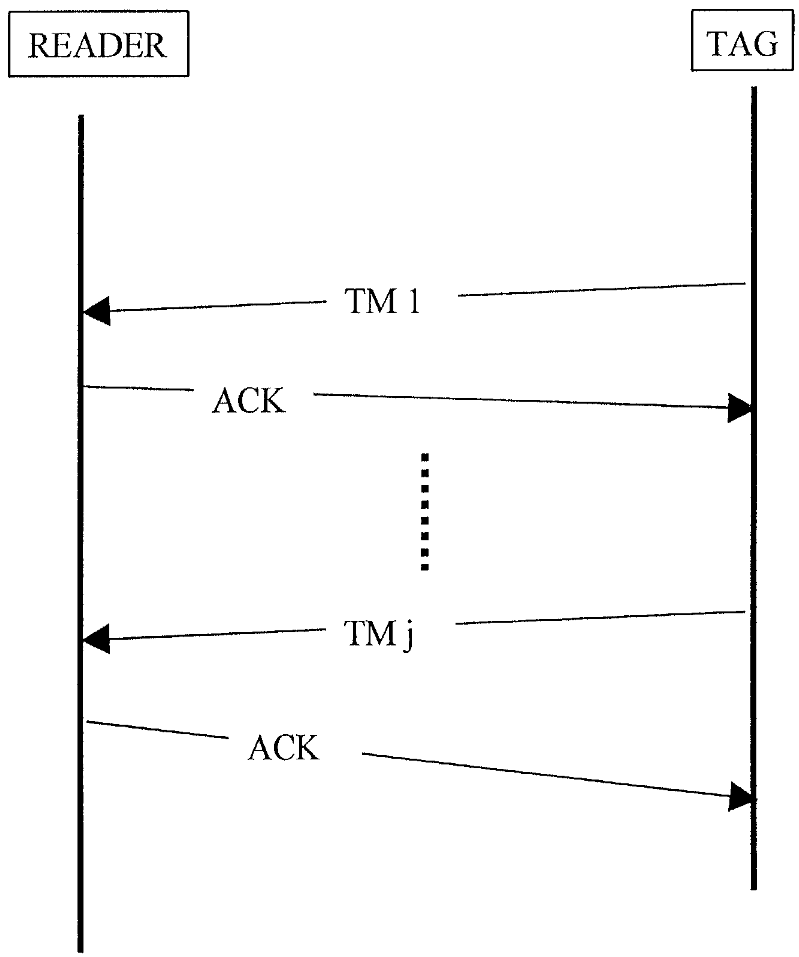


FIG. 11

FIG. 12

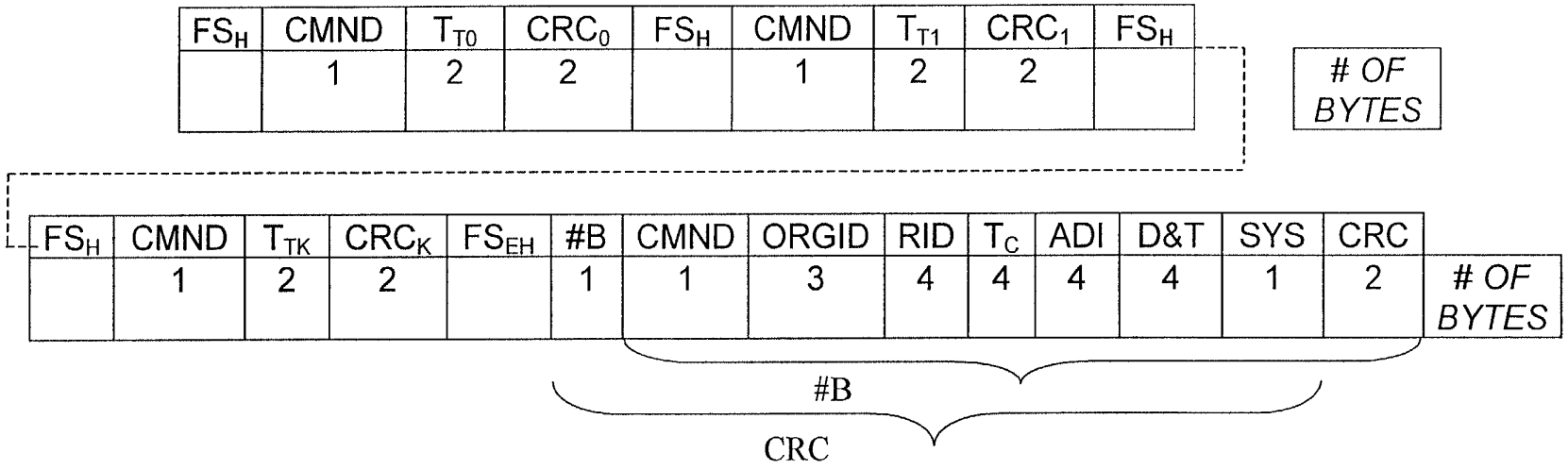
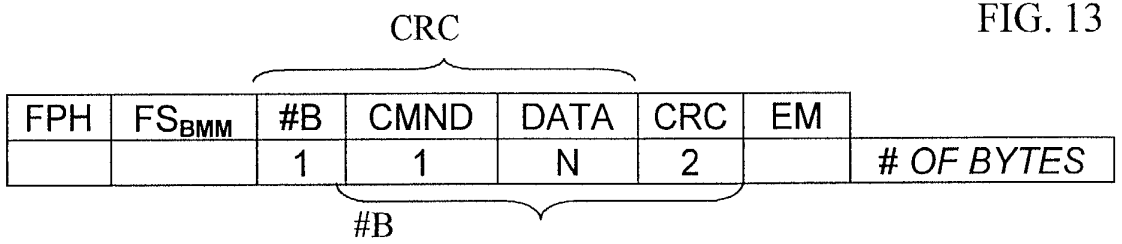

FSH
CMND
TT0
CRC0
FSH
CMND
TT1
CRC1
FSH
1
2
2
1
2
2
OF BYTES
FSH
CMND
TTK
CRCK
FSEH
#B
CMND
ORGID
RID
TC
ADI
D&T
SYS
CRC
1
2
2
1
1
3
4
4
4
4
1
2
OF BYTES
#B
CRC

FIG. 13


CRC
FPH
FSBMM
#B
CMND
DATA
CRC
EM
1
1
N
2
OF BYTES
#B

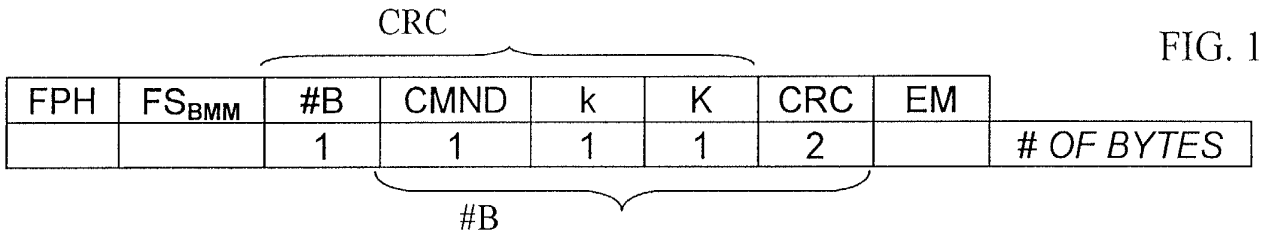


FIG. 14

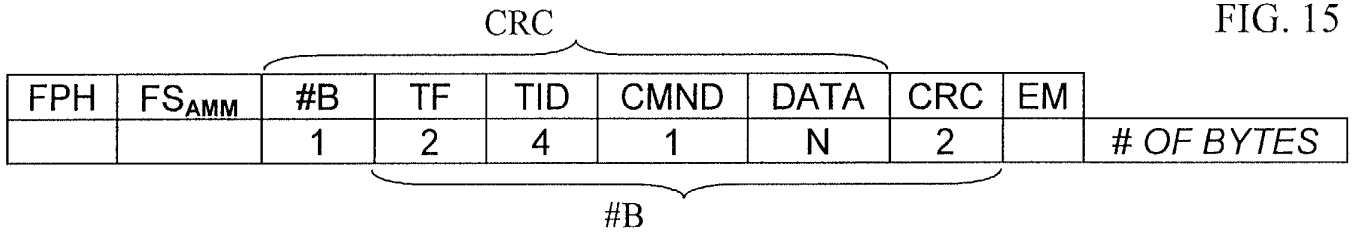


FIG. 15

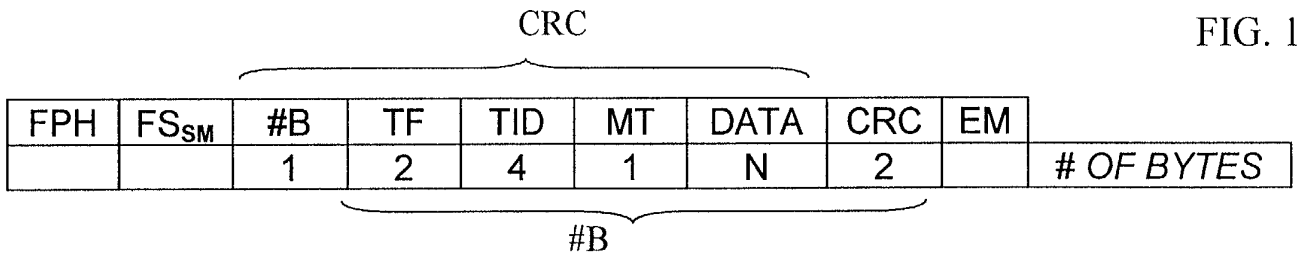


FIG. 16

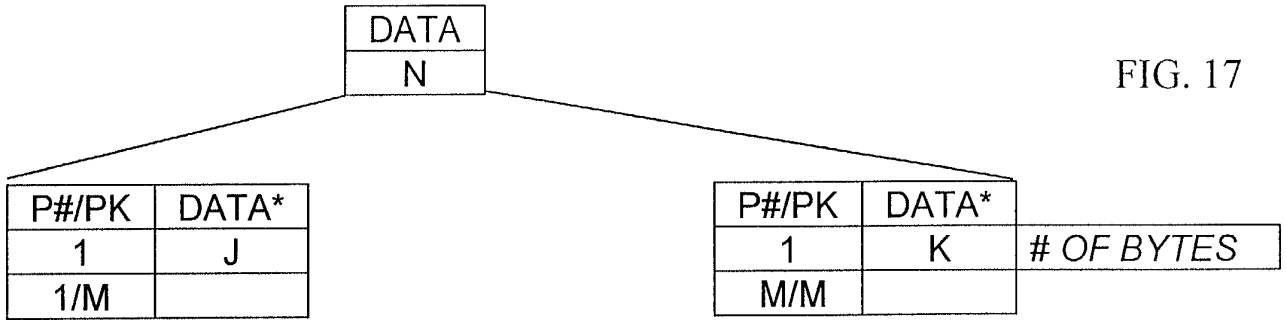


FIG. 17

FIG. 18A

	COMMANDS SET	CODE	COMMENTS
1	VERIFY	10H	NORMAL INTERROGATION CYCLE FOR READING SHORT STATUS INFORMATION FROM SEALS AND TAGS.
2	TAMPER	11H	TAMPER INTERROGATION CYCLE FOR READING SHORT STATUS INFORMATION FROM SEALS AND TAGS. ONLY TAMPERED DEVICES WILL RESPOND TO THIS COMMAND.
3	SET	18H	COMMUNICATION CYCLE TO SET SPECIFIC SEALS AND TAGS.
6	READ DATA	33H	COMMUNICATION CYCLE TO READ A BLOCK OF DATA FROM SEALS AND TAGS MEMORY.
7	WRITE DATA	40H	COMMUNICATION CYCLE TO WRITE A BLOCK OF DATA TO A SEAL OR A TAG.
8	ASSIGN SLOTS	50H	INTERROGATION CYCLE FOR ASSIGNING COMMUNICATION SLOTS FOR SEALS AND TAGS. VALID ONLY FOR WAKEUPS COMMANDS.
9	CLEAR ASSIGNMENT.	51H	STOPS FIXED ASSIGNED MODE.
10	DEEP SLEEP	60H	COMMUNICATION CYCLE TO SET SPECIFIC SEALS AND TAGS INTO A DEEP SLEEP MODE NOT TO INTERFERE.

	COMMANDS SET	CODE	COMMENTS
11	HARD WAKEUP	61H	COMMUNICATION CYCLE TO RESET SPECIFIC SEALS AND TAGS FROM A DEEP SLEEP MODE TO FUNCTION NORMALLY.
12	RESET DATA BLOCK	2AH	COMMUNICATION CYCLE TO RESET THE DATA BLOCK IN SPECIFIC SEALS AND TAGS.
13	START ALERT BURST MODE	70H	COMMAND THAT ACTIVATES TAGS AND SEALS TO BURST INTO THE ALERT RECEIVING WINDOW IN CASE OF AN ALERT DETECTION.
14	STOP ALERT BURST MODE	72H	COMMAND THAT DEACTIVATES TAGS AND SEALS TO BURST INTO THE ALERT RECEIVING WINDOW. THIS COMMAND CAN BE A GENERAL ONE FOR ALL TAGS. THIS CAN BE AS ACKNOWLEDGE TO SPECIFIC TAGS.
15	ACKNOWLEDGE - ALERT MESSAGE	73 H	THIS IS TO ACKNOWLEDGE SPECIFIC TAG OR TAGS THAT THEIR ALERT MESSAGE WAS RECEIVED, AND THEY MAY STOP BURSTING UNTIL A NEW ALERT IS DETECTED.

FIG. 18B

	COMMANDS SET	CODE	COMMENTS
16	START ALERT BURST MODE UNSYNCHRONIZED	38 H	COMMAND THAT ACTIVATES TAGS AND SEALS TO BURST IN CASE OF AN ALERT DETECTION. BURSTING IN INDEPENDENT OF SYSTEM TIMING.
17	STOP ALERT BURST MODE UNSYNCHRONIZED	39 H	COMMAND THAT DEACTIVATES TAGS AND SEALS TO BURST. THIS COMMAND CAN BE A GENERAL ONE FOR ALL TAGS. THIS CAN BE AS ACKNOWLEDGE TO SPECIFIC TAGS.
18	ACKNOWLEDGE – UNSYNCHRONIZED ALERT MESSAGE	76 H	THIS IS TO ACKNOWLEDGE A SPECIFIC TAG THAT ITS ALERT MESSAGE WAS RECEIVED, AND IT CAN STOP BURSTING UNTIL A NEW ALERT IS DETECTED.
19	REST STATUS	43H	COMMUNICATION CYCLE TO RESET THE STATUS FLAGS OF A SPECIFIC SEAL OR TAG. NOT ALL THE FLAGS CAN BE RESET.
20	LONG VERIFY	12H	INTERROGATION CYCLE WITH VERY LONG T_{RW}. SYSTEM RESPONDS LIKE IN WAKEUP 1.

FIG. 18C

	COMMANDS SET	CODE	COMMENTS
21	SYNC VERIFY	13H	INTERROGATION CYCLE FOR READING SHORT STATUS INFORMATION FROM ASSIGNED SEALS. THIS COMMAND USES THE PREVIOUS SETTINGS OF SYSTEM TIMINGS.
22	FILTER	14H	INTERROGATION CYCLE WITH FEEDBACK FROM THE READER FOR THE RANDOM ACCESS WINDOW. THIS IS TO REDUCE NUMBER OF TAGS IN THIS WINDOW FROM CYCLE TO CYCLE.
23	START BURST MODE	15H	THIS IS A COMMAND TO INSTRUCT TAGS AND SEAL TO REPORT FREQUENTLY ON THEIR CURRENT STATUS INDEPENDENTLY. THIS IS NOT A MASTER SLAVE MODE.
24	HARD VERIFY	16H	THIS IS A COMMAND TO INSTRUCT TAGS THAT ARE IN THE DEEP SLEEP MODE TO RESPOND. THIS COMMAND IS EXACTLY LIKE THE WAKEUP 1 BUT WITH A DIFFERENT OPCODE.

FIG. 18D

	COMMANDS SET	CODE	COMMENTS
25	TRACK	1FH	THIS IS A COMMAND IDENTICAL TO WAKEUP 1 FOR TRACKING APPLICATIONS WHERE WE NEED THE TRACKING MESSAGES TMM ON TOP OF THE BMM.
26	WRITE PARAMETER	41H	THIS COMMAND IS TO MODIFY SYSTEM PARAMETERS. THE READER RECONFIGURES THE TAGS DEFAULT VALUES. PARAMETERS LIKE: ADI, T_{HW}, ETC. THIS COMMAND SUPORTS THE TABLE IN PARA 5.2
27	READ PARAMETER	24H	THIS COMMAND IS TO READ SYSTEM PARAMETERS. THIS COMMAND SUPORTS THE TABLE IN PARA 5.2
28	SYNC	80H	NO OPERATION. THIS COMMAND IS TO KEEP TAGS SYNCHRONIZE WITH THE READER FOR LONG TIME. IN THIS COMMAND, TAGS DO NOT RESPOND, THEY ONLY WAKEUP AND GO BACK TO SLEEP.
29	LOCK	85H	THIS COMMAND WILL LOCK ACCESS TO MODIFY PARAMETERS AFTER PRODUCTION.

FIG. 18E

FIG. 18F

	COMMANDS SET	CODE	COMMENTS
30	SUSPENDED SET	21H	THIS COMMAND IS A DELAYED SET. IT WILL BE EXECUTED AUTOMATICALY BY THE SEAL AFTER THE SEAL WIRE IS CLOSED.
31	ADDRESED WAKEUP1N	17H	THIS COMMAND WILL GENERATE A WAKEUP1N TO SPECIFIC SEALS.
32	ADDRESED READ EVENTS	33H	THIS COMMAND WILL READ EVENTS FROM A SPECIFIC SEAL.
33	SOFT SET	1AH	SOFT SET IS THE COMMAND THAT LEAVES SET FOOT PRINT AS AN EVENT BUT DON'T RESET SEAL'S MEMORY.

FIG. 19A

ROW #	PARAMETER NAME	PARAMETER CODE	PARAMETER SYNTAX	READ/ WRITE ACCESS	DEFAULT VALUE	PROTECTED BY LOCK	WAKEUP BIT ACCESS ORDER	PARAMETER LENGTH
1	TAG/SEAL SHORT STATUS	00HEX	TS	R			15	1 BYTE
2	DATE & TIME	01 HEX	D&T	R/W			14	4 BYTES
3	RESISTANCE	02 HEX	RES	R			13	1 BYTE
4	# OF EVENTS	03 HEX	#EV	R			12	1 BYTE
5	LIFE COUNTER	04 HEX	LFC	R		+	11	2 BYTES
6	RANDOM VALUE	05 HEX	RND	R			10	1 BYTE
7	VERSION OF FIRMWARE	06 HEX	VER	R		+	9	1 BYTE
8	LONG STATUS	07 HEX	LTS	R			8	2 BYTES
9	RSSI	08 HEX	RSSI	R			7	1 BYTE
10	T_W	31 HEX	TW	R/W	1000		6	2 BYTES
11	RID	20 HEX	RID	R/W	00000000		5	4 BYTES

FIG. 19B

ROW #	PARAMETER NAME	PARAMETER CODE	PARAMETER SYNTAX	READ/ WRITE ACCESS	DEFAULT VALUE	PROTECTED BY LOCK	WAKEUP BIT ACCESS ORDER	PARAMETER LENGTH
12	ADI	13 HEX	ADI	R/W	00000000		4	4 BYTES
13	ORGID	12 HEX	ORGID	R/W	000000		3	3 BYTES
14	TA	33 HEX	TA	R/W	10		2	1 BYTE
15	TP	32 HEX	TP	R/W			1	

FIG. 20A

INTERVAL NAME	INTERVAL SYNTAX	COMMENTS	DEFAULT VALUE
READER INTERROGATION HEADER	T_{HW}	INTERROGATION HEADER TIME DURATION. NOT INCLUDING THE XMM. RESOLUTION IS 1.024 MSEC.	3000
READER RECEIVING WINDOW	T_{RW}	TIME DURATION FROM THE END OF THE RECEIVED IH TO THE BEGINNING OF THE NEXT IH. RESOLUTION IS 1.024 MSEC. DEFINED IN THE IH.	1000
READERS INTERLACE WINDOW	T_{IW}	TIME DURATION OF THE WINDOW ALLOWING OTHER READERS TO BURST IN. RESOLUTION IS 1.024 MSEC. DEFINED IN THE BMM, TMM.	0
FIXED ASSIGNMENT WINDOW	T_{DW}	RESOLUTION IS 1.024 MSEC.	0
RANDOM ACCESS RECEIVING WINDOW	T_{CW}	RESOLUTION IS 1.024 MSEC.	-
ALERT RECEIVING WINDOW	T_{AW}	RESOLUTION IS 1.024 MSEC.	-
TAG RESPONSE TIME SLOT.	T_S	DEFINED IN THE BMM, TMM.	

FIG. 20B

INTERVAL NAME	INTERVAL SYNTAX	COMMENTS	DEFAULT VALUE
HEADER TIMER	T_{TI}	THIS TIMER IS TO INDICATE THE TAG, HOW MUCH IS LEFT TO THE END OF THE IH. RESOLUTION IS 1.024 MSEC. DEFINED IN THE IH	
ASSIGN MODE TIME OUT	T_A	A TIME OUT ALGORITHM IS USED IN THE ASSIGNED MODE IN ORDER NOT TO HAVE DEADLOCKS. RESOLUTION IS 1 SEC.	20 SEC
TAG TIME SLOT POSITION	T_D	THIS IS THE POSITION OF A TAG'S SLOT IN THE T_{RW} . RESOLUTION IS 1.024 MSEC. DEFINED IN THE BMM, TMM.	0
UNSYNCHRONIZED TAG WAKEUP CYCLE	T_{UNSYNC}	CYCLE DURATION FOR WAKEUP 5 COMMAND. RESOLUTION IS 0.1 SEC. DEFINED IN THE BMM, TMM.	0
DEEP SLEEP WAKEUP CYCLE.	T_P	TO SAVE POWER IN DEEP SLEEP, THE WAKEUP CYCLE IS LONGER THEN USUSAL. RESOLUTION IS 1 SEC	4 SEC.
SEAL WAKEUP FREQUENCY	T_W	WAKEUP FREQUENCY OF THE SEAL. THIS VALUE SHOULD BE LESS THEN T_{IIW}	300 MS
ALERT UNSYNC REPETITION RATE	T_{BRS}	THIS PARAMETER DETERMINES THE REPETION RATE OF THE ALERT BURSTS. RESOLUTION IS 1 SEC.	5 SEC.
SESSION CYCLE TIME	T_C	THIS IS THE CYCLE TIME OF CONSECUTIVE SESSIONS IN A REPETITIVE MODE OF OPERATION.	0

FIG. 21

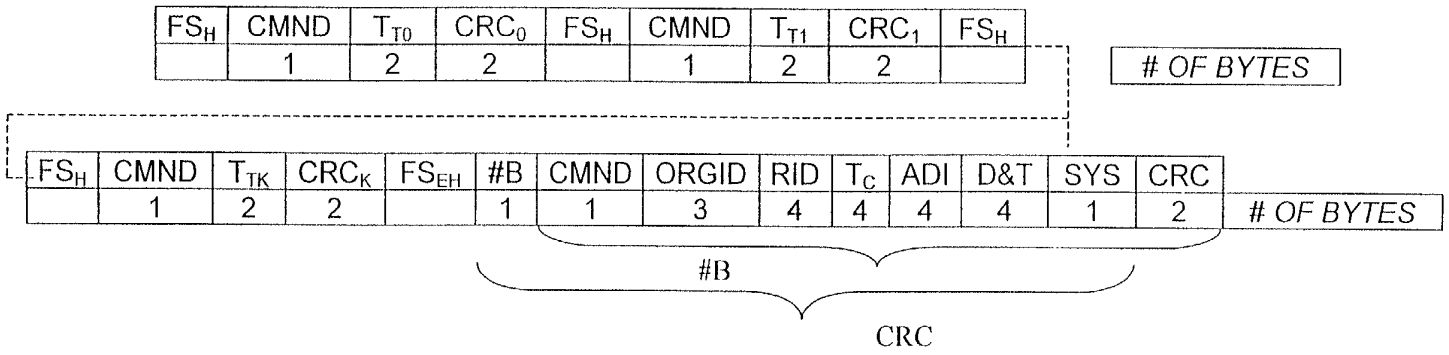

FSH | CMND | TT0 | CRC0 | FSH | CMND | TT1 | CRC1 | FSH
1 | 2 | 2 | 1 | 2 | 2
OF BYTES
FSH | CMND | TTK | CRCK | FSEH | #B | CMND | ORGID | RID | TC | ADI | D&T | SYS | CRC
1 | 2 | 2 | 1 | 1 | 3 | 4 | 4 | 4 | 4 | 1 | 2
OF BYTES
#B
CRC

FIG. 22

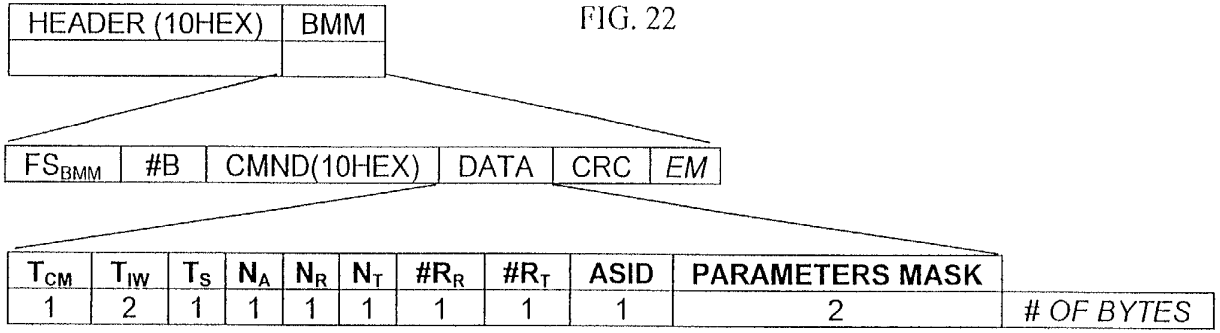

HEADER (10HEX) | BMM
FSBMM | #B | CMND(10HEX) | DATA | CRC | EM
TCM | TIW | TS | NA | NR | NT | #RR | #RT | ASID | PARAMETERS MASK
1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2
OF BYTES

FIG. 23

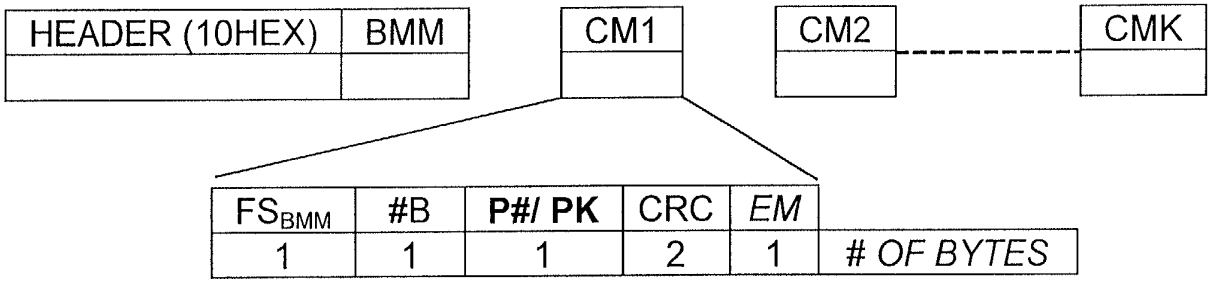


FIG. 24A

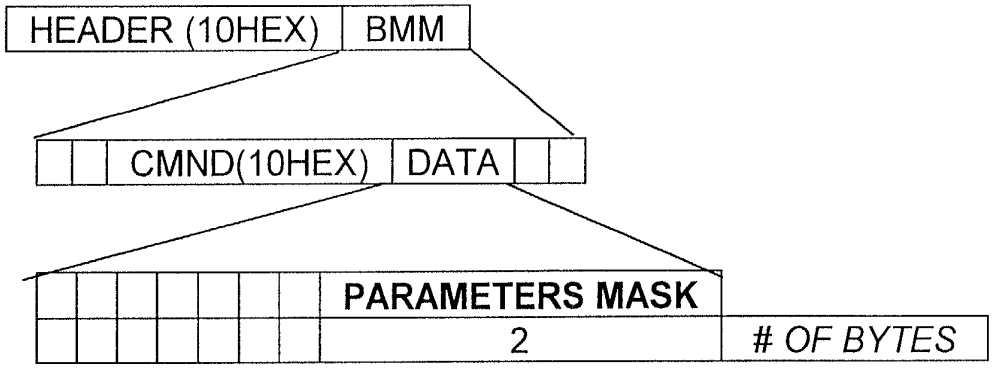


FIG. 24B

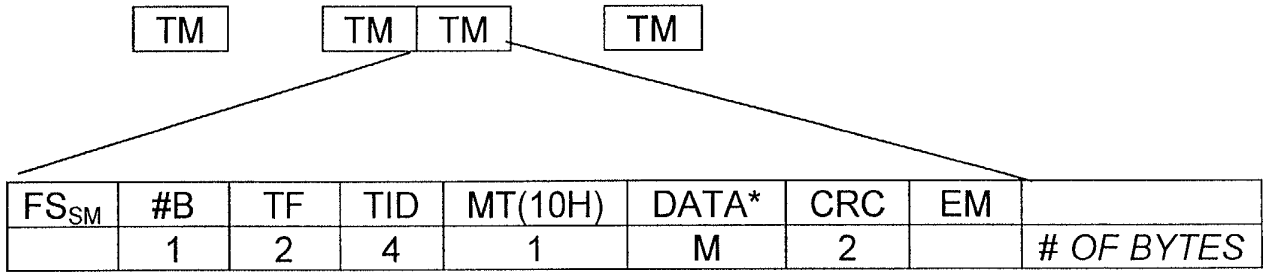


FIG. 25

HIGH BYTE						LOW BYTE			
BIT 7	BIT 6	BIT 5	BIT 4				BIT 3	BIT 2	*BIT 0*
PAR # 1	PAR # 2	P # 3	P # 4	P # 5	- - - -	P # 13	P # 14	P # 15	*PAR # 16*

FIG. 26A

HIGH BYTE								LOW BYTE								*BYTE*
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	*BIT #*
1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	*MASK*

FIG. 26B

DATA* RESPONSE

TS	D&T	RES	#EV	LFC	RND	VER	
1	4	1	1	2	1	2	*# OF BYTES*

FIG. 27A

HIGH BYTE								LOW BYTE								*BYTE*
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	*BIT #*
1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	*MASK*

FIG. 27B

DATA* RESPONSE

TS	D&T	VER	
1	4	2	*# OF BYTES*

FIG. 28A

HIGH BYTE								LOW BYTE								*BYTE*
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	*BIT #*
1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	*MASK*

DATA* RESPONSE

FIG. 28B

TS	VER	D&T	ORGID	
1	2	4	3	*# OF BYTES*

FIG. 29

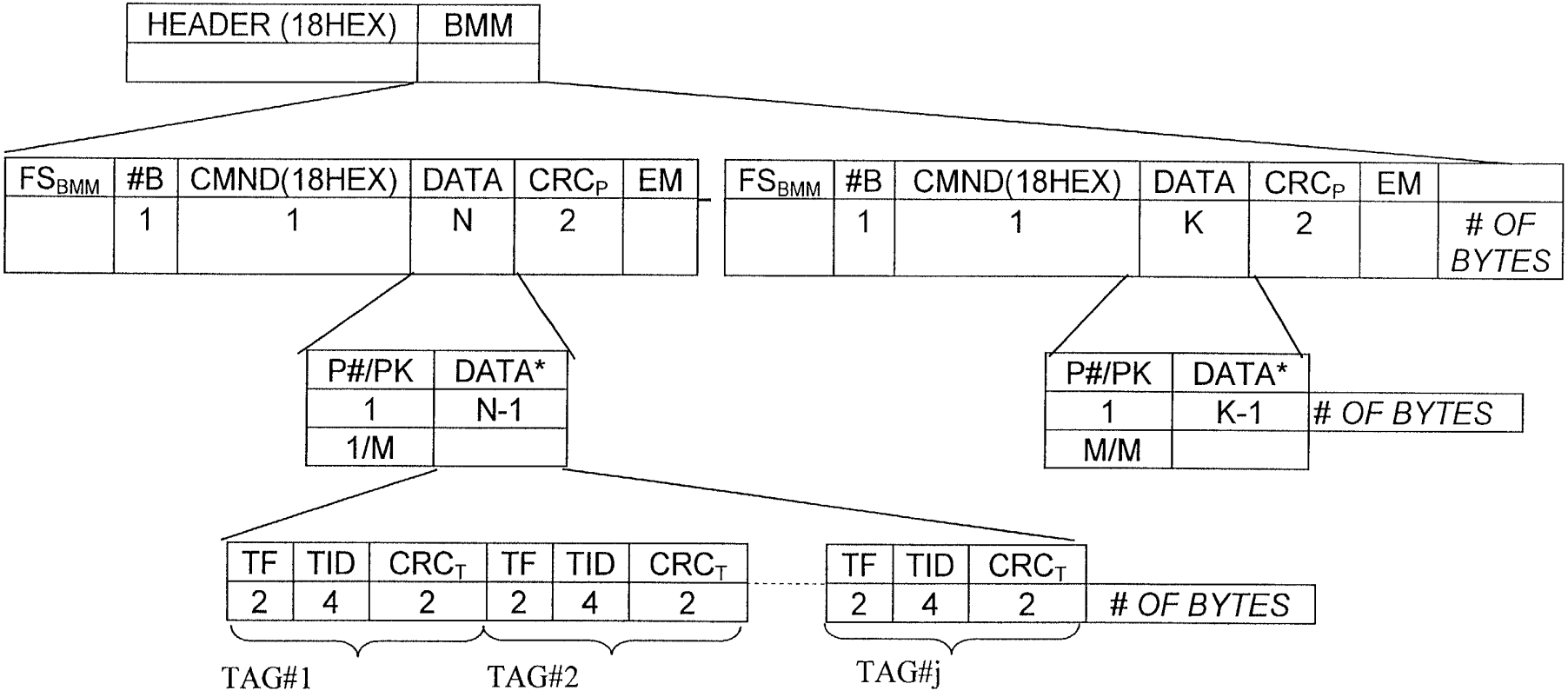

HEADER (18HEX)
BMM
FSBMM
#B
CMND(18HEX)
DATA
CRCP
EM
1
1
N
2
FSBMM
#B
CMND(18HEX)
DATA
CRCP
EM
1
1
K
2
OF BYTES
P#/PK
DATA*
1
N-1
1/M
P#/PK
DATA*
1
K-1
OF BYTES
M/M
TF
TID
CRCT
TF
TID
CRCT
2
4
2
2
4
2
TF
TID
CRCT
2
4
2
OF BYTES
TAG#1
TAG#2
TAG#j

FIG. 30

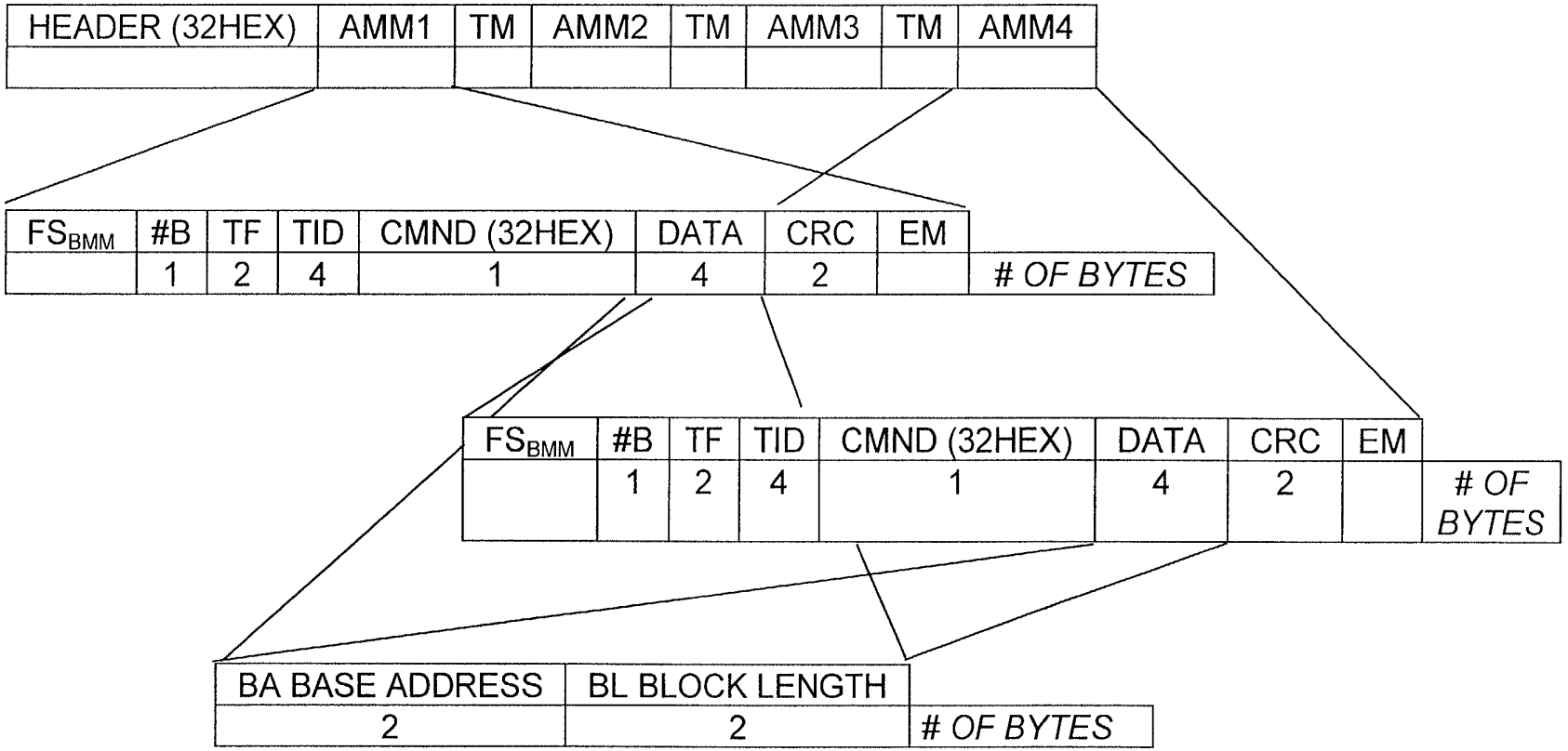

HEADER (32HEX)
AMM1
TM
AMM2
TM
AMM3
TM
AMM4
FS BMM
#B
TF
TID
CMND (32HEX)
DATA
CRC
EM
1
2
4
1
4
2
OF BYTES
FS BMM
#B
TF
TID
CMND (32HEX)
DATA
CRC
EM
1
2
4
1
4
2
OF BYTES
BA BASE ADDRESS
BL BLOCK LENGTH
2
2
OF BYTES

FIG. 31

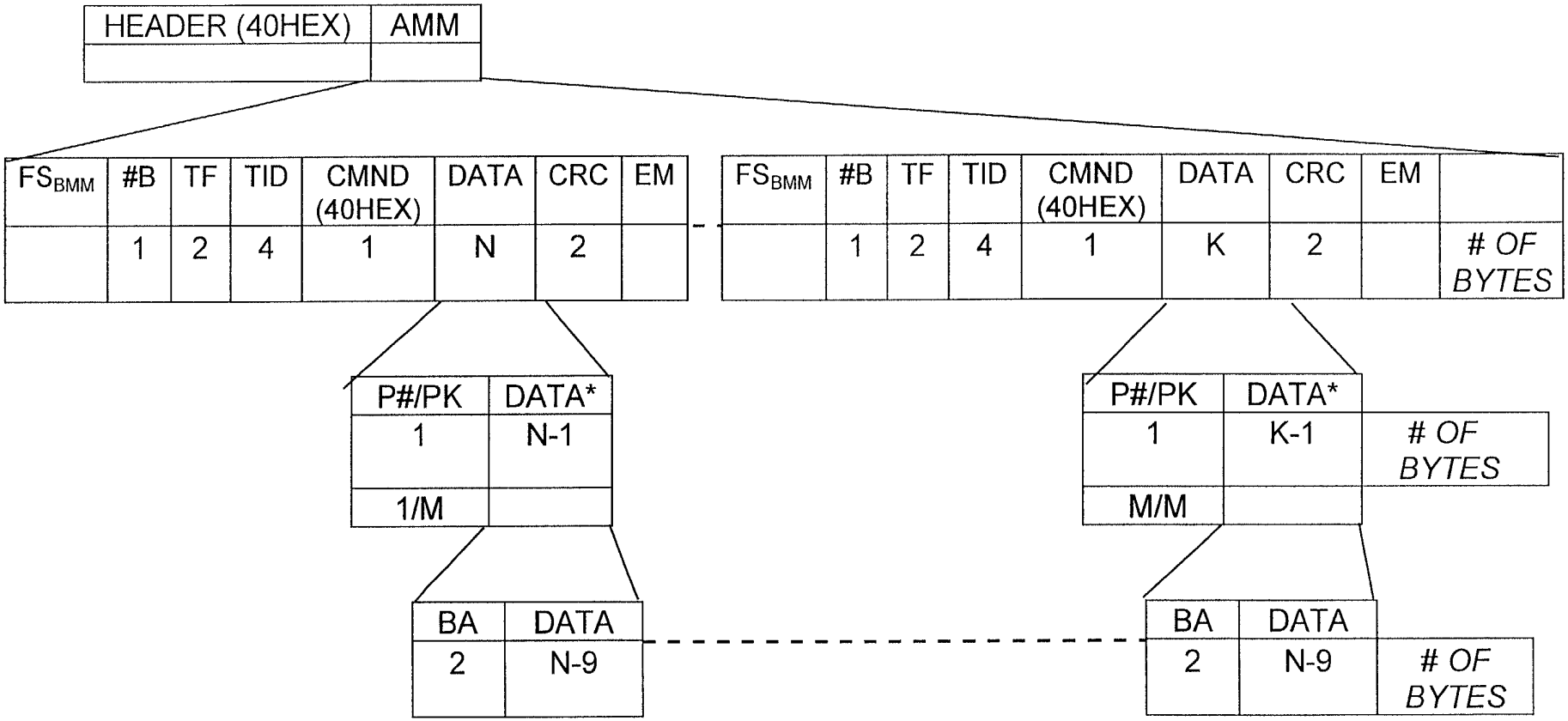

HEADER (40HEX)
AMM
FSBMM
#B
TF
TID
CMND (40HEX)
DATA
CRC
EM
1
2
4
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
K-1
1/M
M/M
BA
DATA
2
N-9

FIG. 32

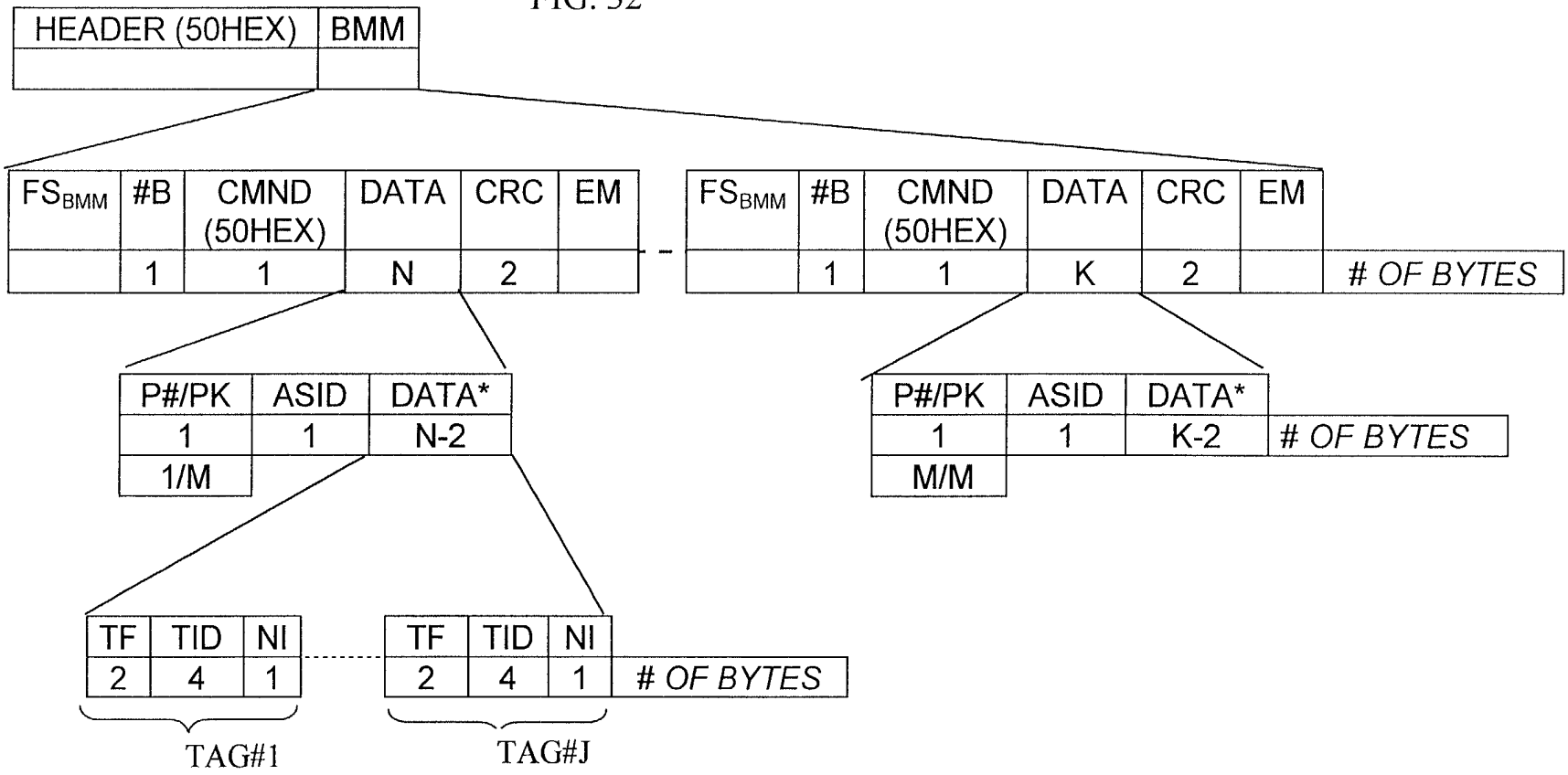

HEADER (50HEX)
BMM
FSBMM
#B
CMND (50HEX)
DATA
CRC
EM
1
1
N
2
K
OF BYTES
P#/PK
ASID
DATA*
1
1/M
N-2
M/M
TF
TID
NI
2
4
1
TAG#1
TAG#J

FIG. 33

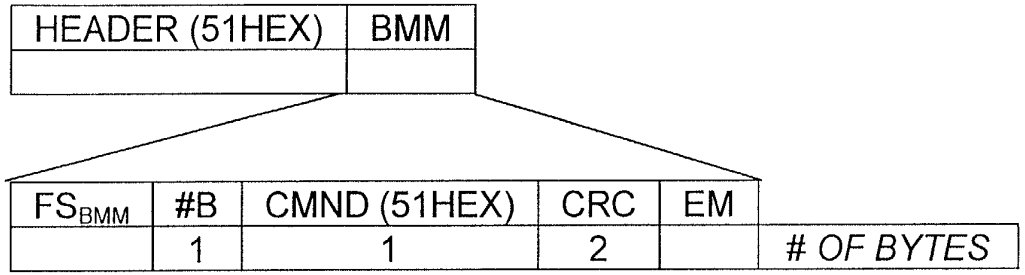


FIG. 34

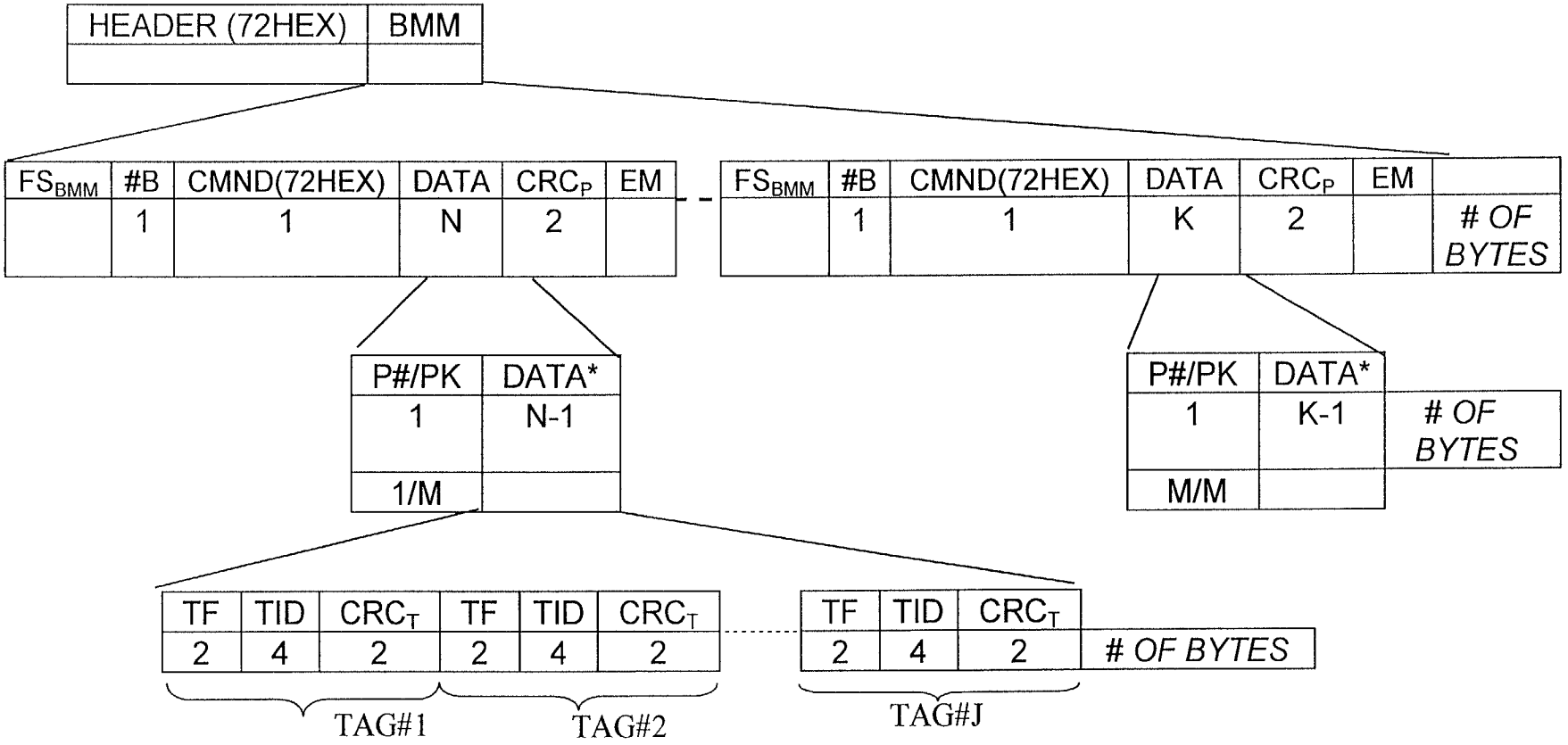
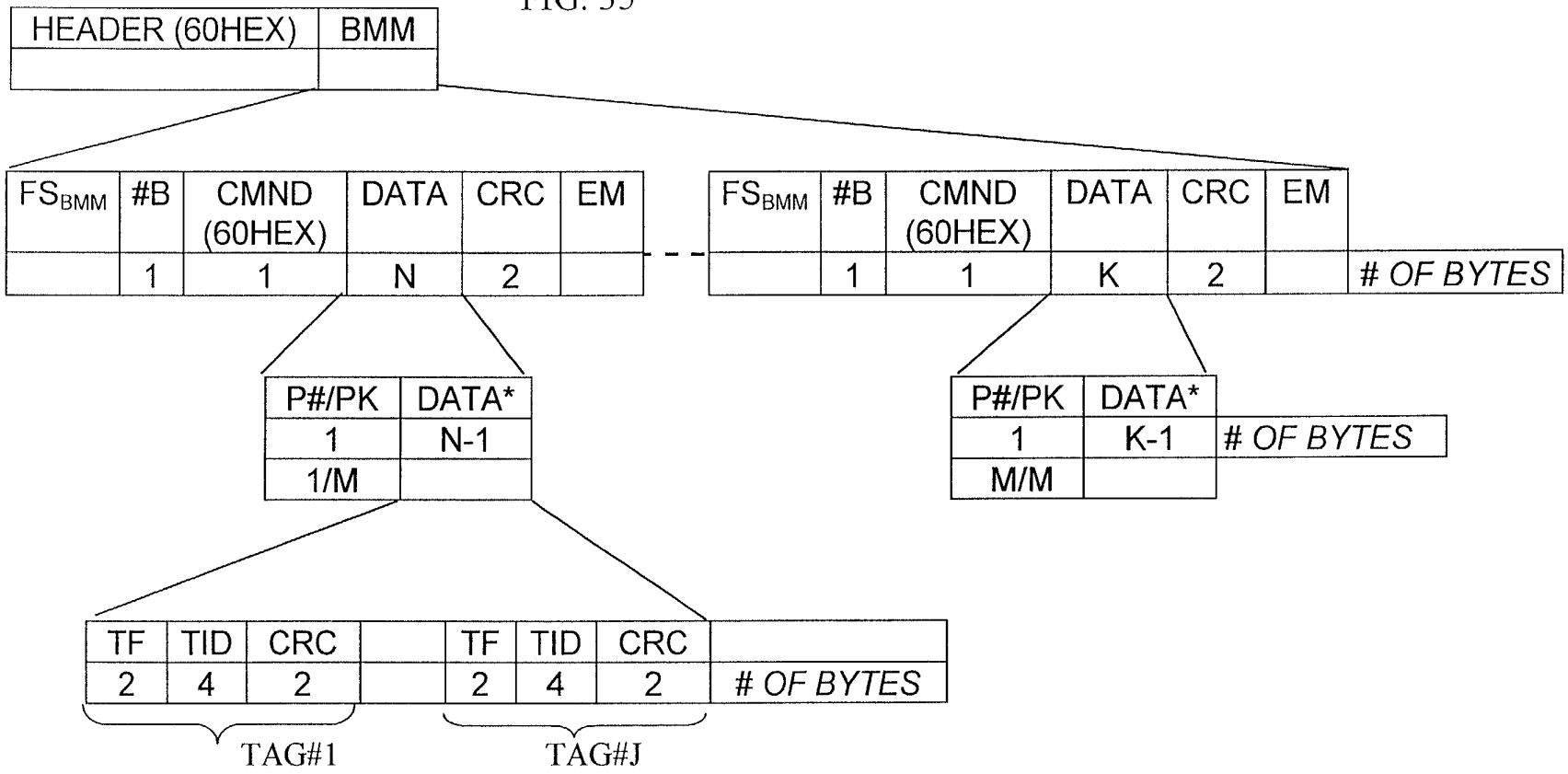

HEADER (72HEX)
BMM
FSBMM
#B
CMND(72HEX)
DATA
CRCP
EM
1
1
N
2
FSBMM
#B
CMND(72HEX)
DATA
CRCP
EM
1
1
K
2
OF BYTES
P#/PK
DATA*
1
N-1
1/M
P#/PK
DATA*
1
K-1
M/M
OF BYTES
TF
TID
CRCT
TF
TID
CRCT
2
4
2
2
4
2
TF
TID
CRCT
2
4
2
OF BYTES
TAG#1
TAG#2
TAG#J

FIG. 35


HEADER (60HEX)
BMM
FSBMM
#B
CMND (60HEX)
DATA
CRC
EM
1
1
N
2
FSBMM
#B
CMND (60HEX)
DATA
CRC
EM
1
1
K
2
OF BYTES
P#/PK
DATA*
1
N-1
1/M
P#/PK
DATA*
1
K-1
OF BYTES
M/M
TF
TID
CRC
TF
TID
CRC
2
4
2
2
4
2
OF BYTES
TAG#1
TAG#J

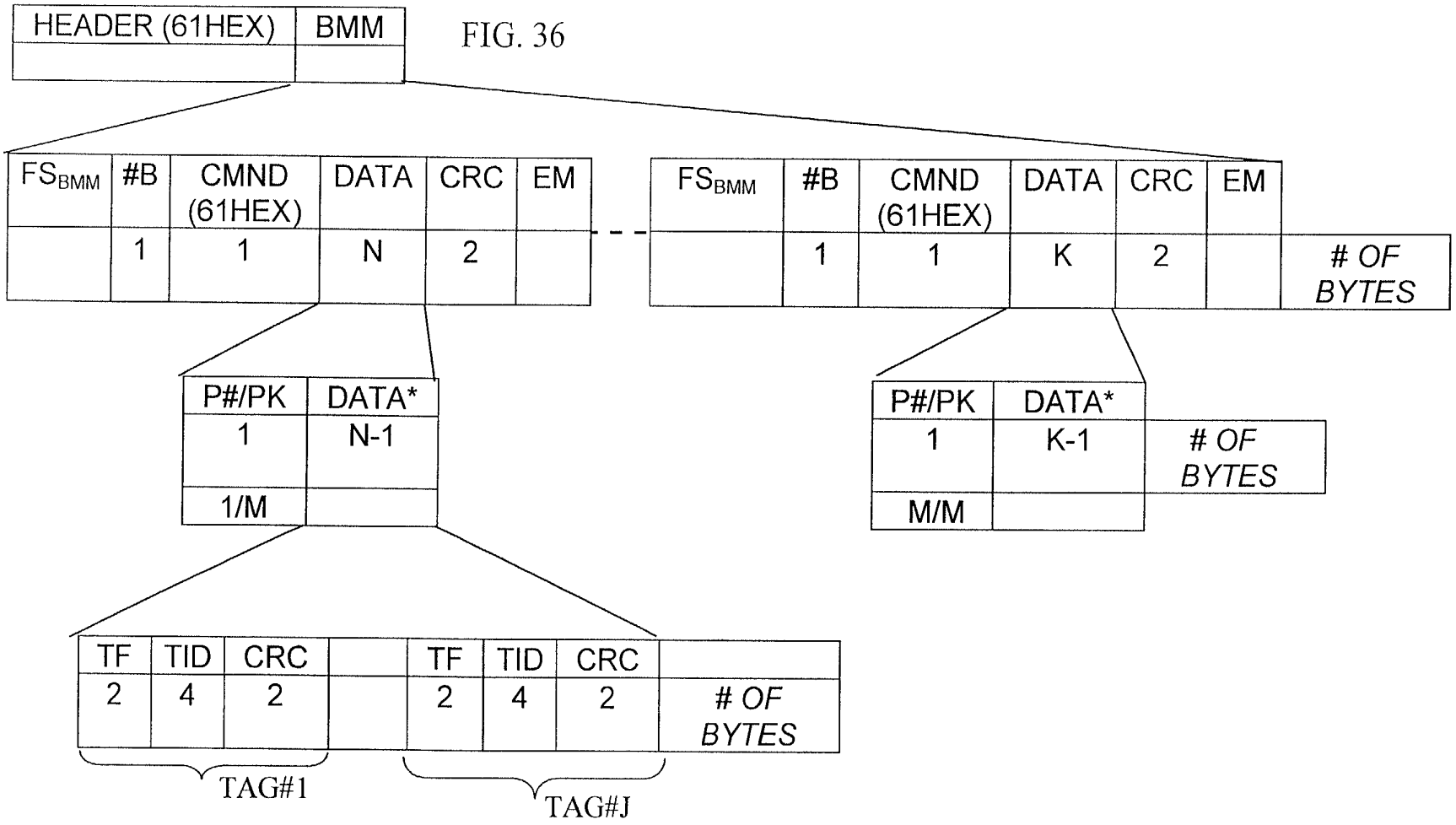

HEADER (61HEX)
BMM
FS_BMM
#B
CMND (61HEX)
DATA
CRC
EM
1
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
1/M
K-1
M/M
TF
TID
CRC
2
4
TAG#1
TAG#J

FIG. 36

FIG. 37

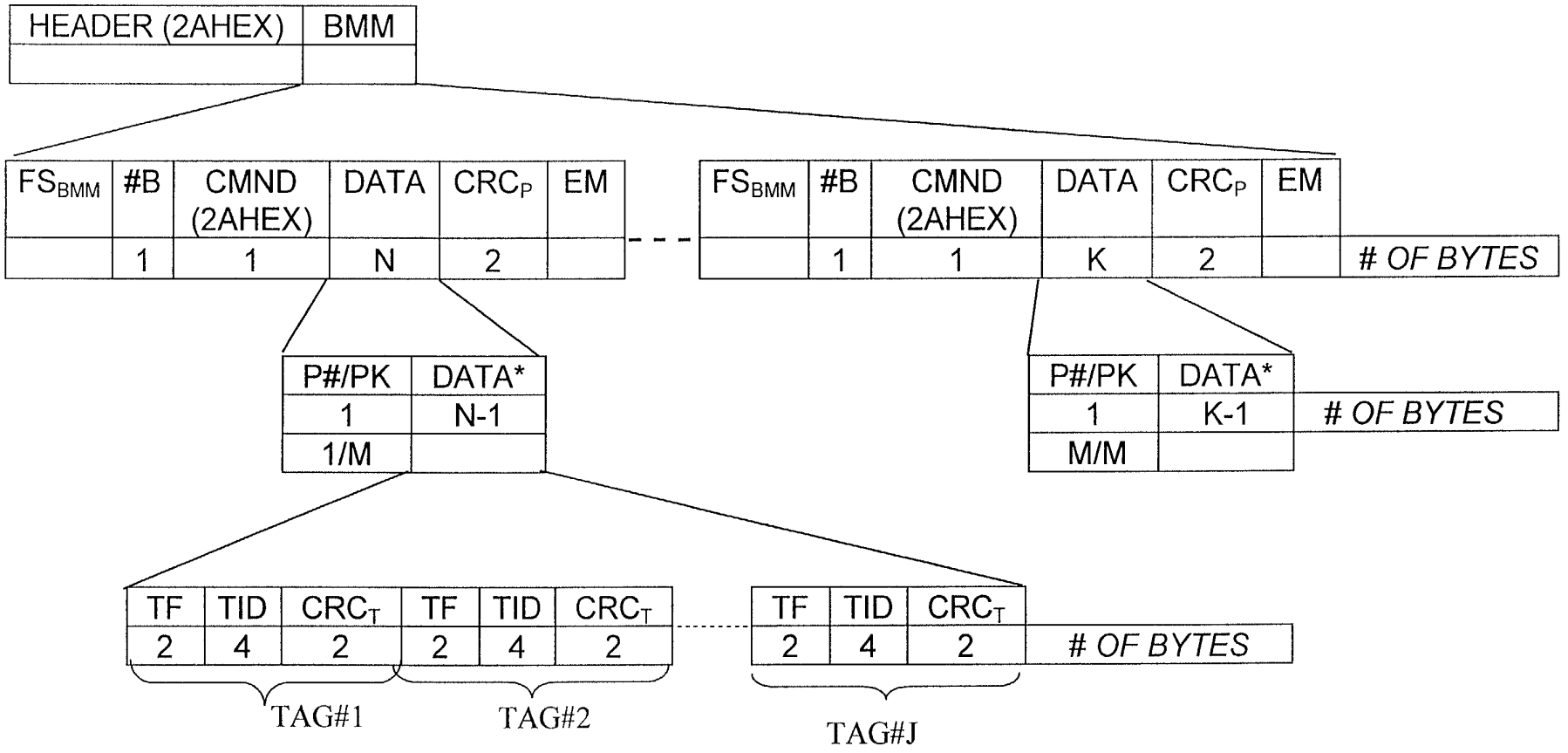

HEADER (2AHEX)
BMM
FSBMM
#B
CMND (2AHEX)
DATA
CRCP
EM
1
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
1/M
K-1
M/M
TF
TID
CRCT
4
TAG#1
TAG#2
TAG#J

FIG. 38

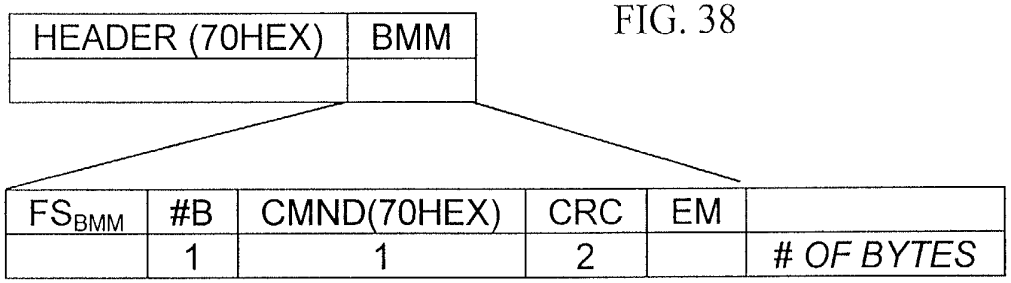


FIG. 39A

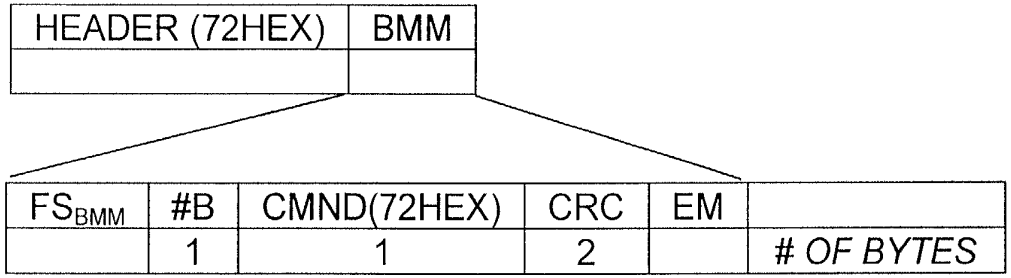


FIG. 39B

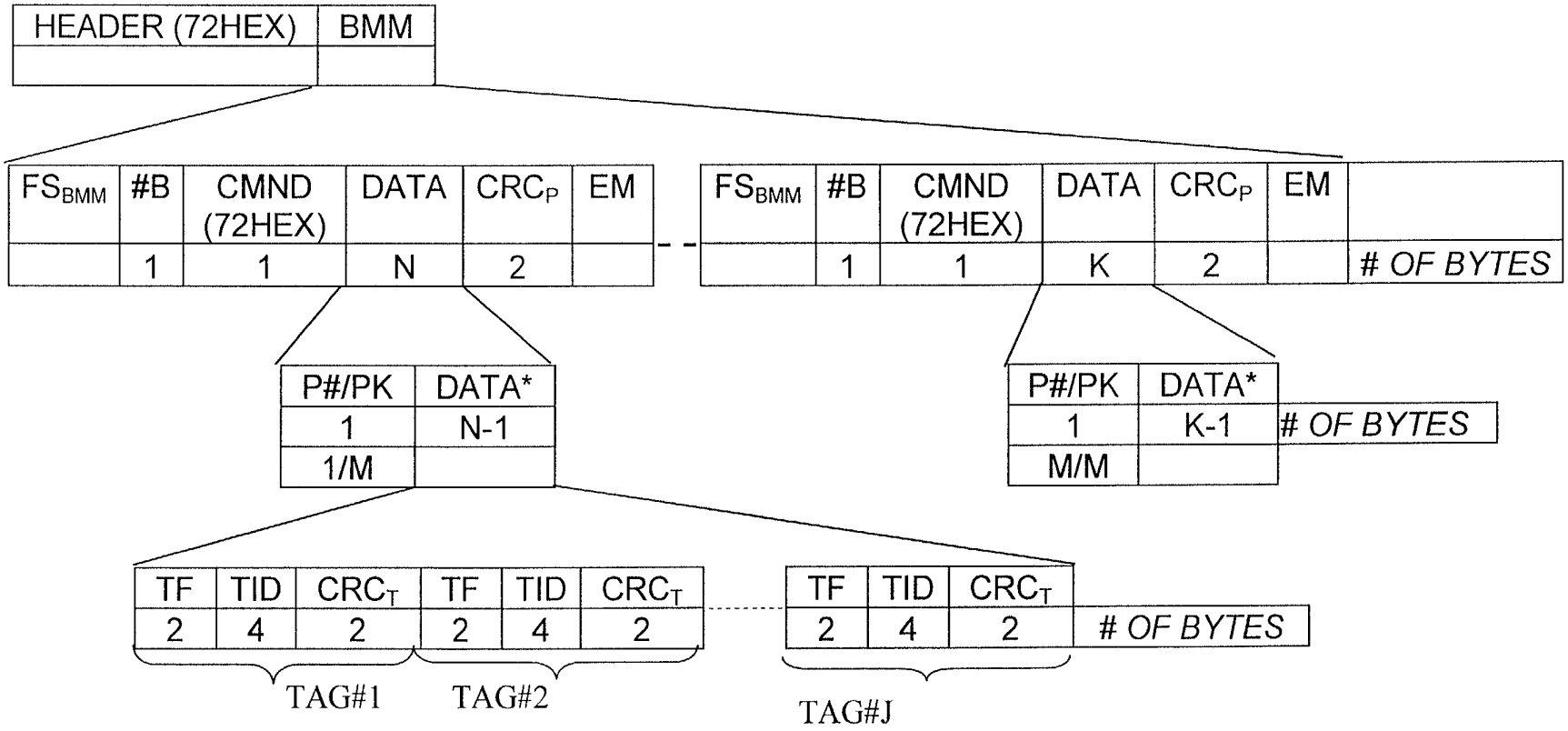

HEADER (72HEX)
BMM
FSBMM
#B
CMND (72HEX)
DATA
CRCP
EM
1
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
1/M
K-1
M/M
TF
TID
CRCT
TAG#1
TAG#2
TAG#J

FIG. 40

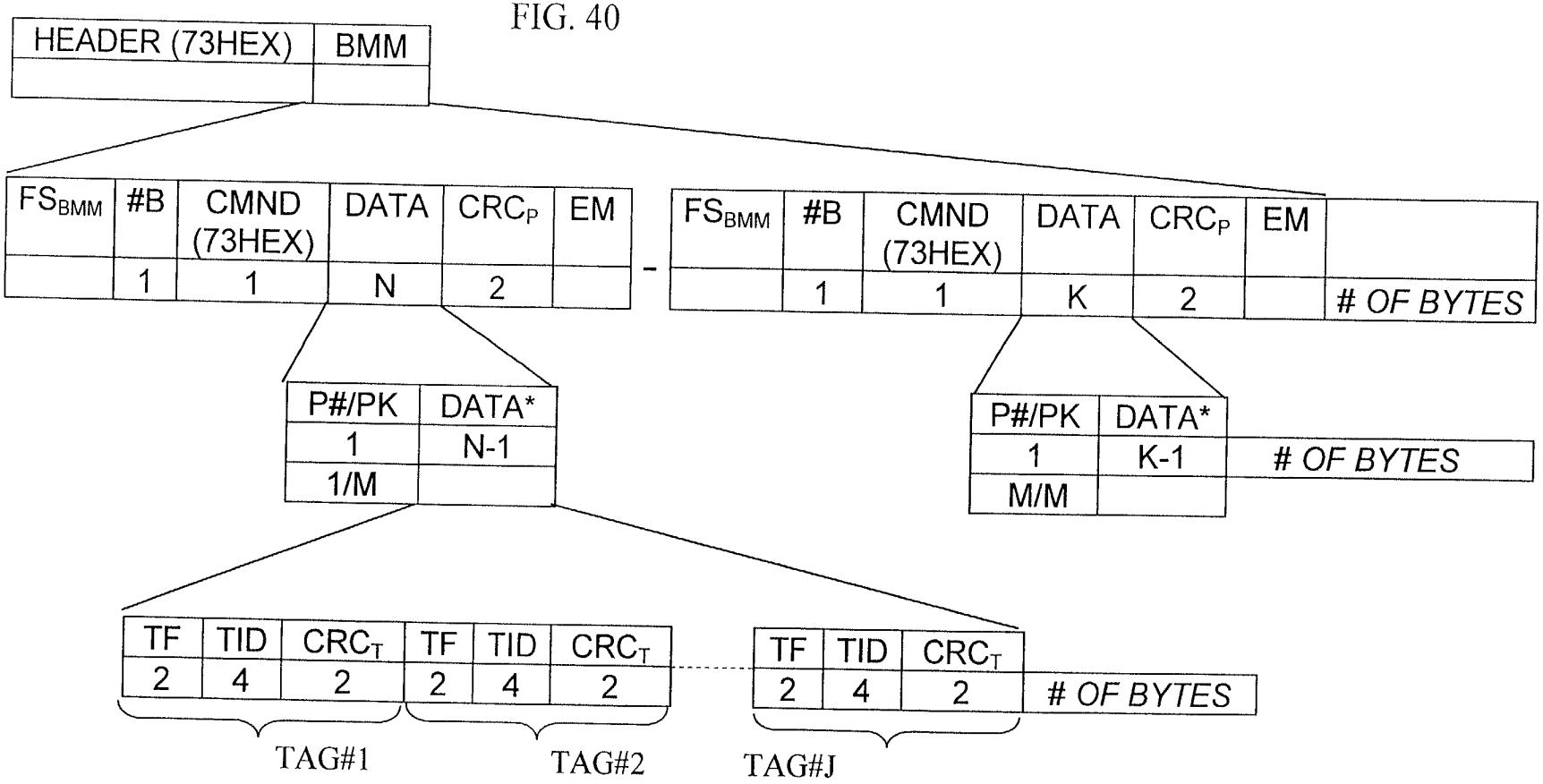

HEADER (73HEX)
BMM
FSBMM
#B
CMND (73HEX)
DATA
CRCP
EM
1
1
N
2
FSBMM
#B
CMND (73HEX)
DATA
CRCP
EM
1
1
K
2
OF BYTES
P#/PK
DATA*
1
N-1
1/M
P#/PK
DATA*
1
K-1
OF BYTES
M/M
TF
TID
CRCT
2
4
2
TF
TID
CRCT
2
4
2
TF
TID
CRCT
2
4
2
OF BYTES
TAG#1
TAG#2
TAG#J

FIG. 41

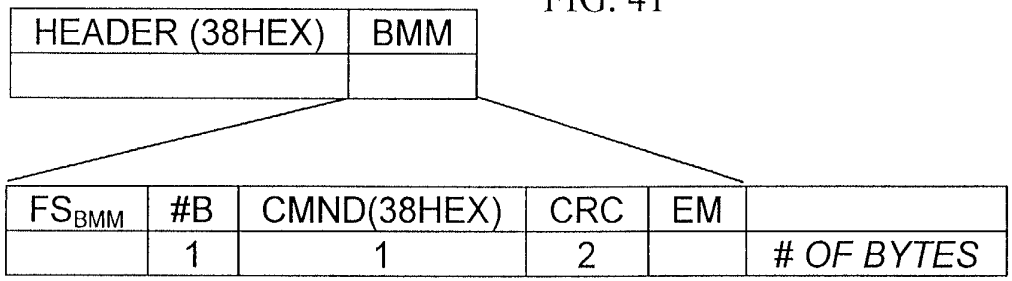


FIG. 42A

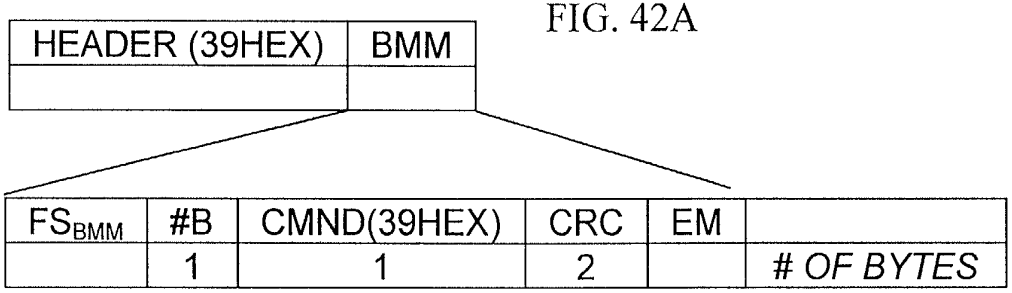


FIG. 42B

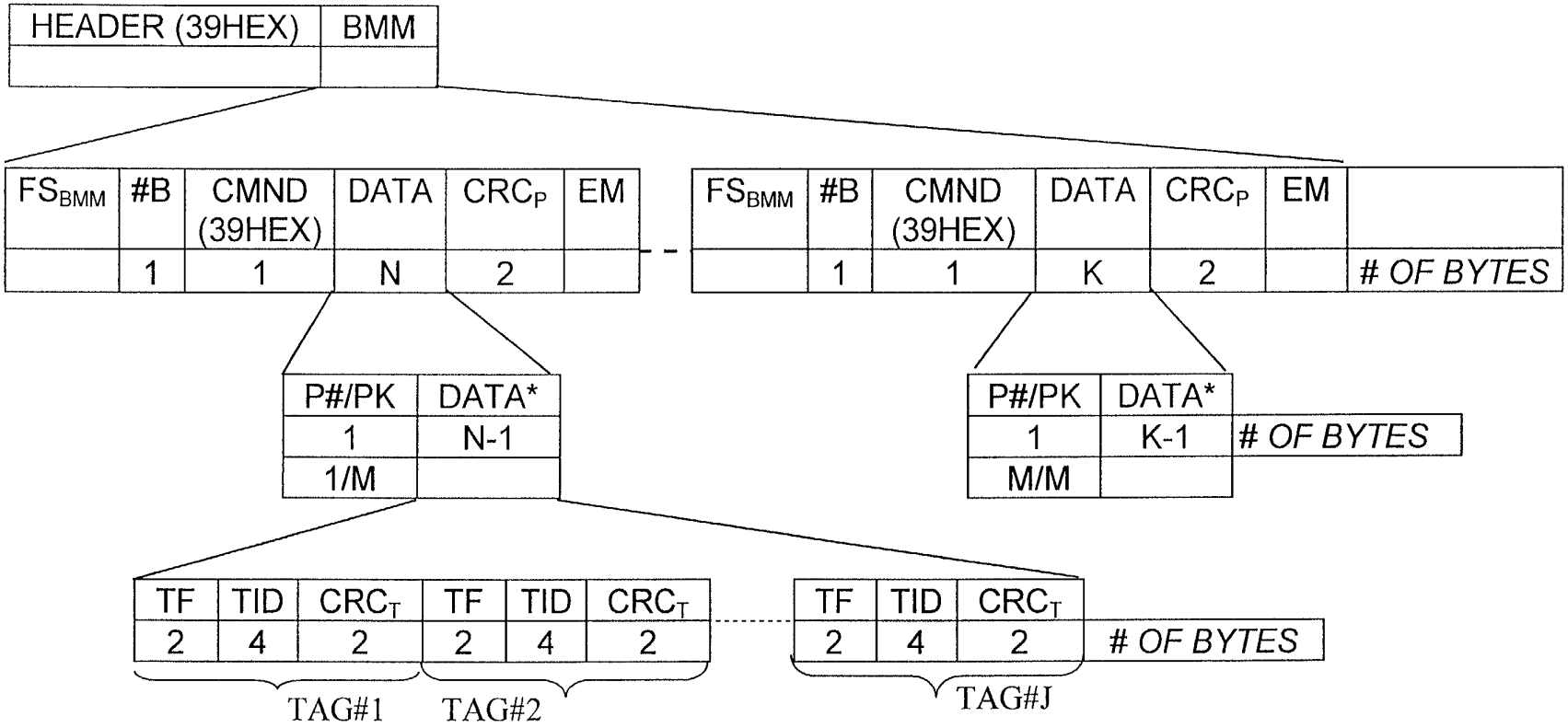

HEADER (39HEX)
BMM
FSBMM
#B
CMND (39HEX)
DATA
CRCP
EM
1
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
1/M
K-1
M/M
TF
TID
CRCT
2
4
TAG#1
TAG#2
TAG#J

FIG. 43

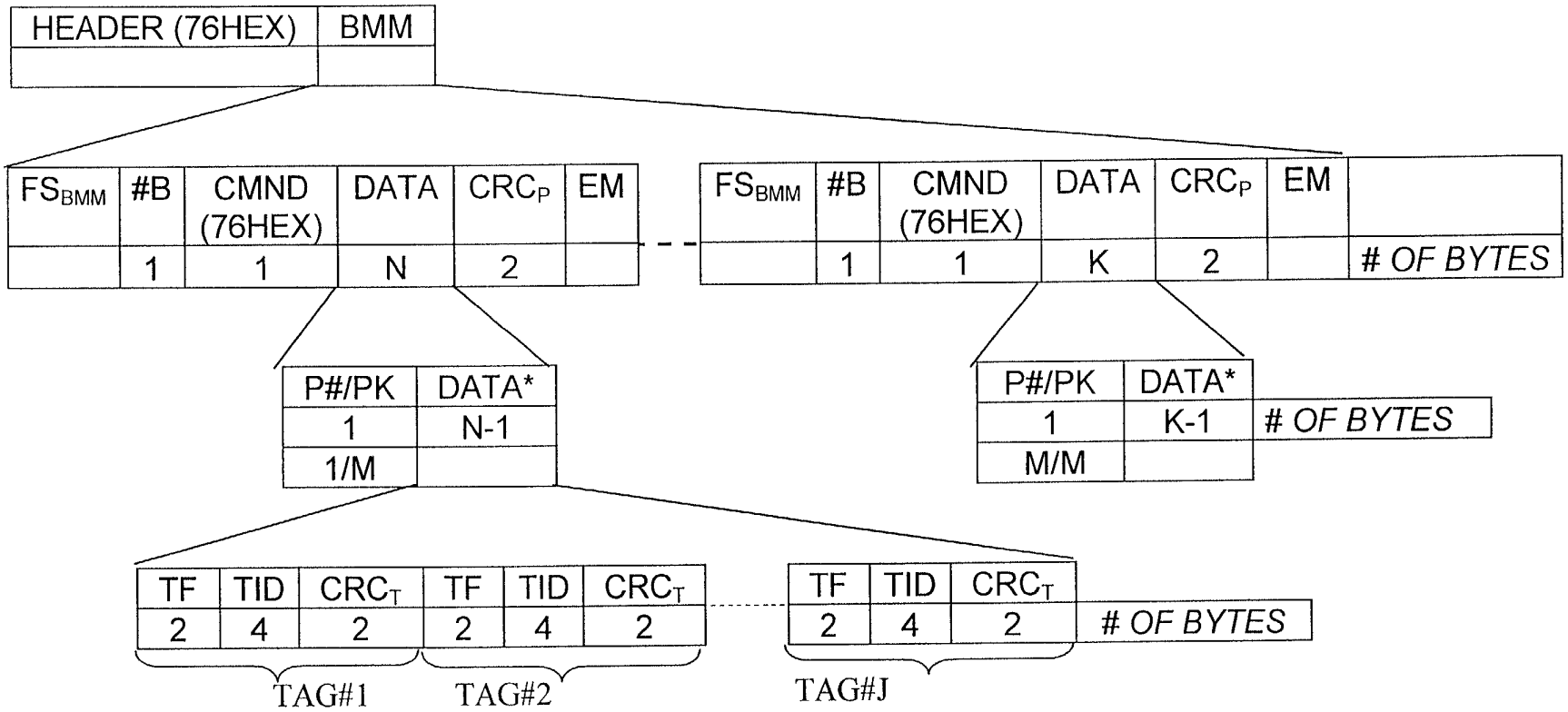

HEADER (76HEX)
BMM
FSBMM
#B
CMND (76HEX)
DATA
CRCP
EM
1
1
N
2
K
OF BYTES
P#/PK
DATA*
1
N-1
1/M
K-1
M/M
TF
TID
CRCT
2
4
TAG#1
TAG#2
TAG#J

FIG. 44

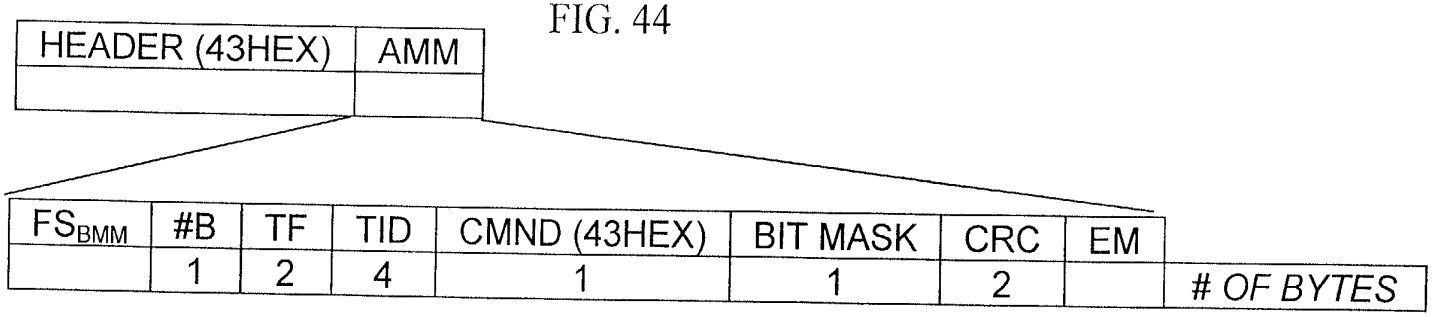

HEADER (43HEX)
AMM
FS BMM
#B
TF
TID
CMND (43HEX)
BIT MASK
CRC
EM
1
2
4
1
1
2
OF BYTES

FIG. 45

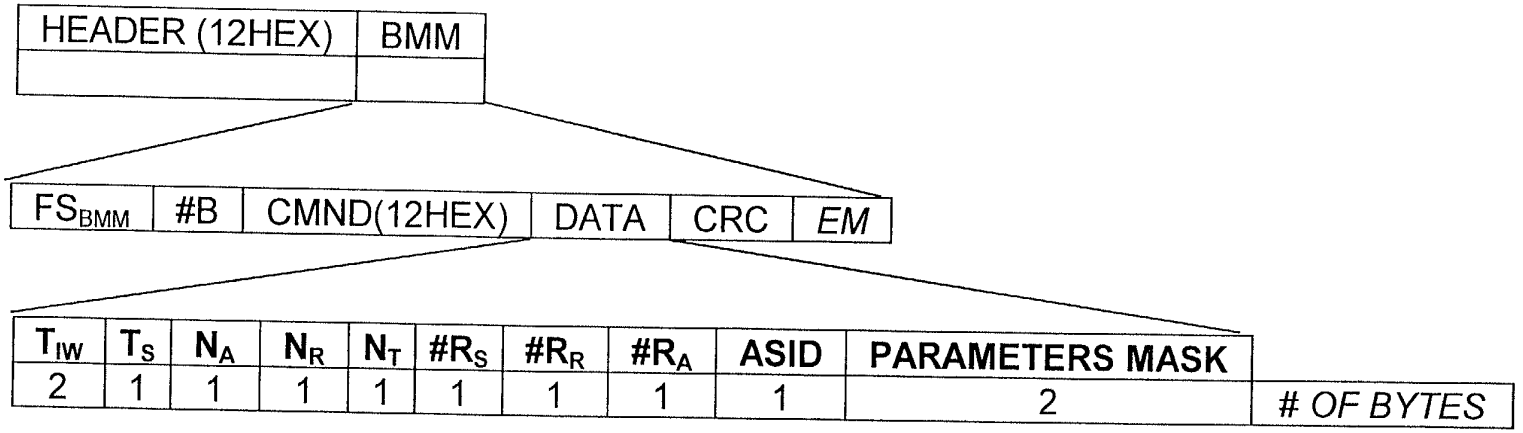

HEADER (12HEX)
BMM
FS BMM
#B
CMND(12HEX)
DATA
CRC
EM
T IW
T S
N A
N R
N T
#R S
#R R
#R A
ASID
PARAMETERS MASK
2
1
1
1
1
1
1
1
1
2
OF BYTES

FIG. 46

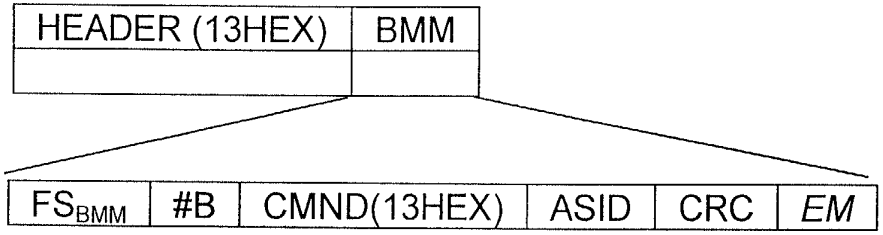


FIG. 47

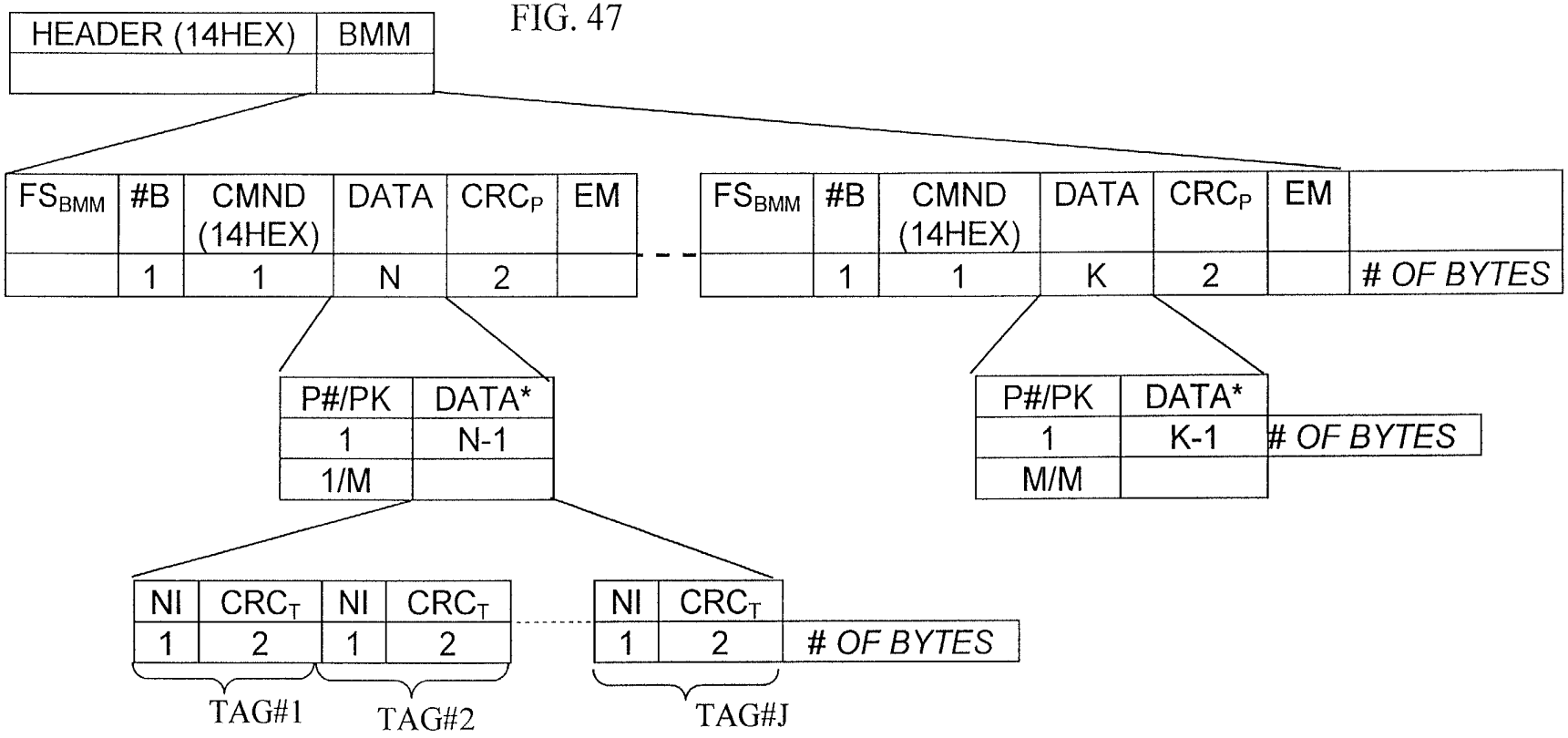

HEADER (14HEX)
BMM
FSBMM
#B
CMND (14HEX)
DATA
CRCP
EM
1
1
N
2
FSBMM
#B
CMND (14HEX)
DATA
CRCP
EM
1
1
K
2
OF BYTES
P#/PK
DATA*
1
N-1
1/M
P#/PK
DATA*
1
K-1
OF BYTES
M/M
NI
CRCT
NI
CRCT
1
2
1
2
NI
CRCT
1
2
OF BYTES
TAG#1
TAG#2
TAG#J

FIG. 48

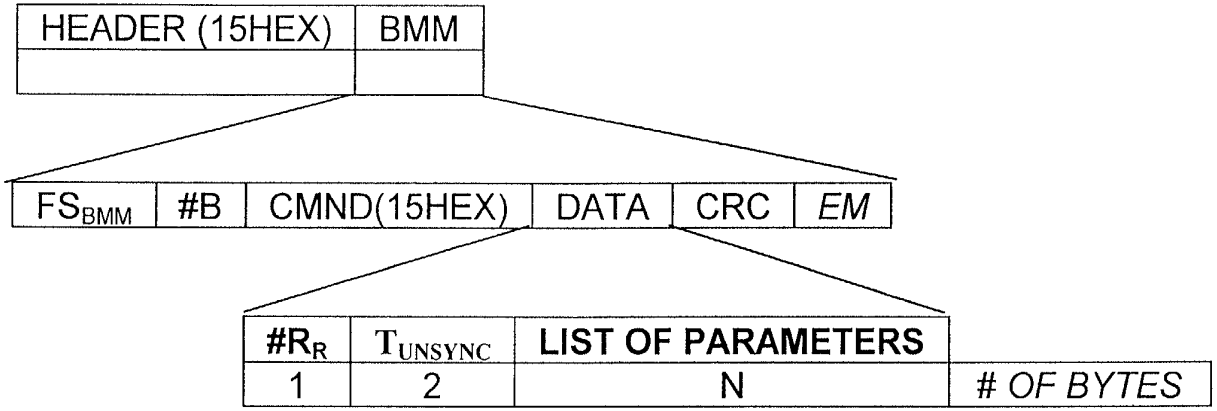

HEADER (15HEX)
BMM
FS_BMM
#B
CMND(15HEX)
DATA
CRC
EM
#R_R
T_UNSYNC
LIST OF PARAMETERS
1
2
N
OF BYTES

FIG. 49

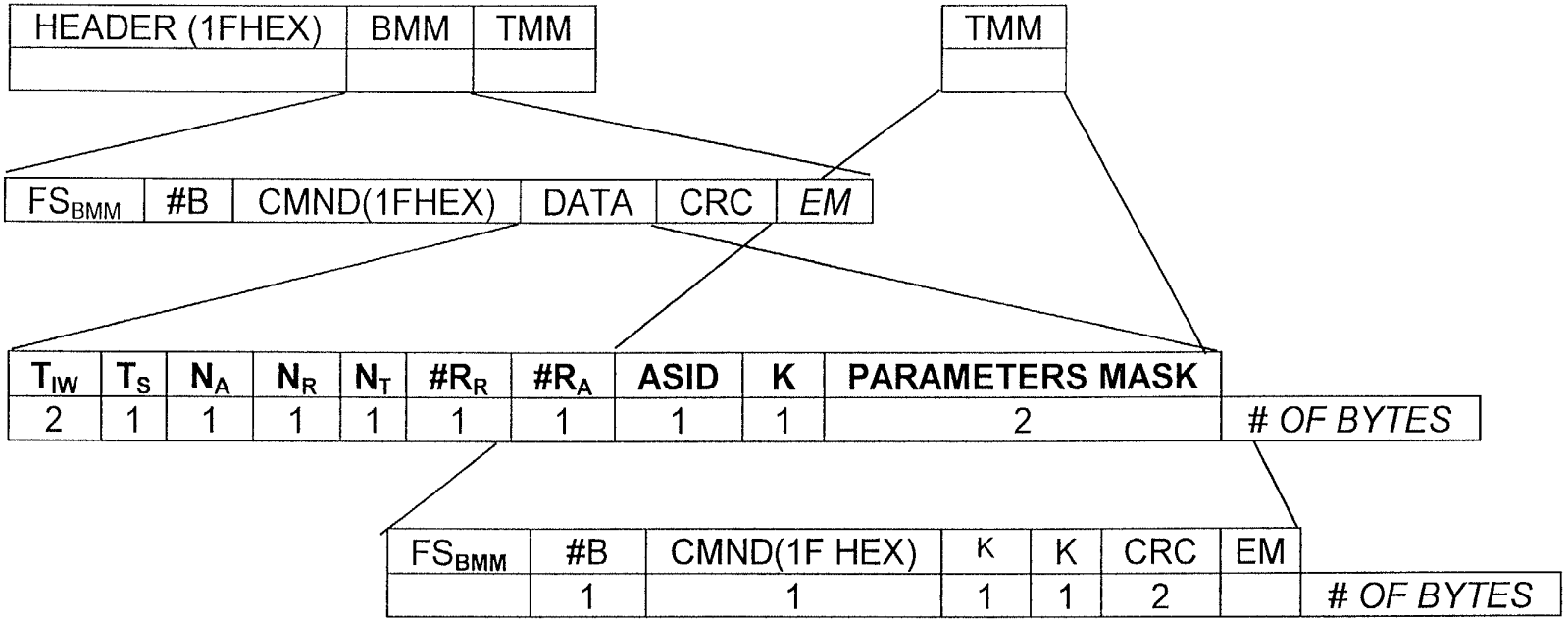

HEADER (1FHEX)
BMM
TMM
TMM
FSBMM
#B
CMND(1FHEX)
DATA
CRC
EM
TIW
TS
NA
NR
NT
#RR
#RA
ASID
K
PARAMETERS MASK
2
1
1
1
1
1
1
1
1
2
OF BYTES
FSBMM
#B
CMND(1F HEX)
K
K
CRC
EM
1
1
1
1
2
OF BYTES

FIG. 50

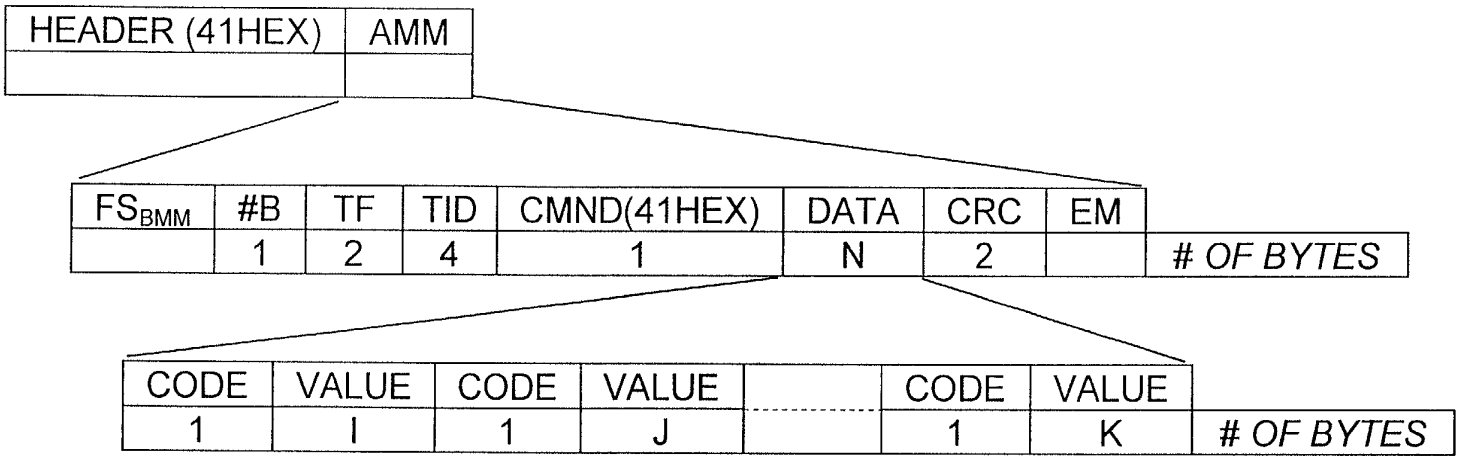

HEADER (41HEX)
AMM
FS_BMM
#B
TF
TID
CMND(41HEX)
DATA
CRC
EM
1
2
4
1
N
2
OF BYTES
CODE
VALUE
CODE
VALUE
CODE
VALUE
1
I
1
J
1
K
OF BYTES

FIG. 51

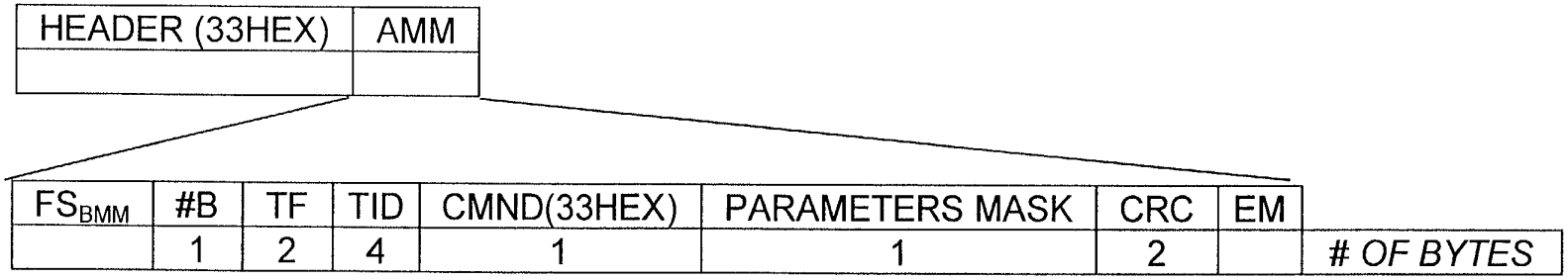

HEADER (33HEX)
AMM
FS_BMM
#B
TF
TID
CMND(33HEX)
PARAMETERS MASK
CRC
EM
1
2
4
1
1
2
OF BYTES

FIG. 52

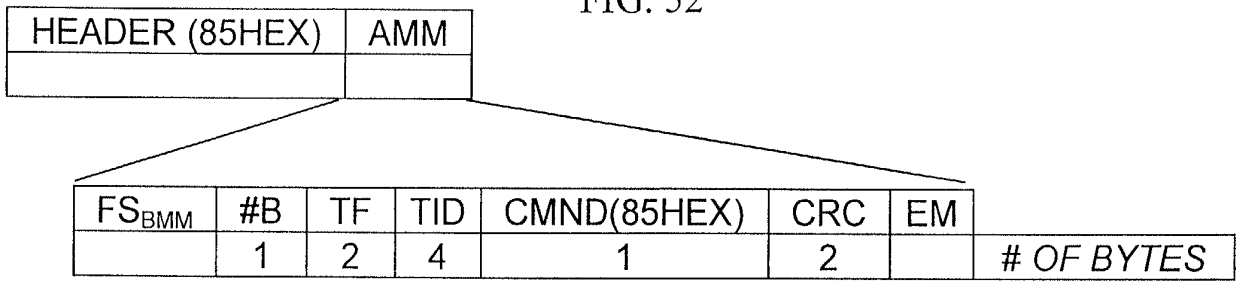

HEADER (85HEX)
AMM
FS BMM
#B
TF
TID
CMND(85HEX)
CRC
EM
1
2
4
1
2
OF BYTES

FIG. 53

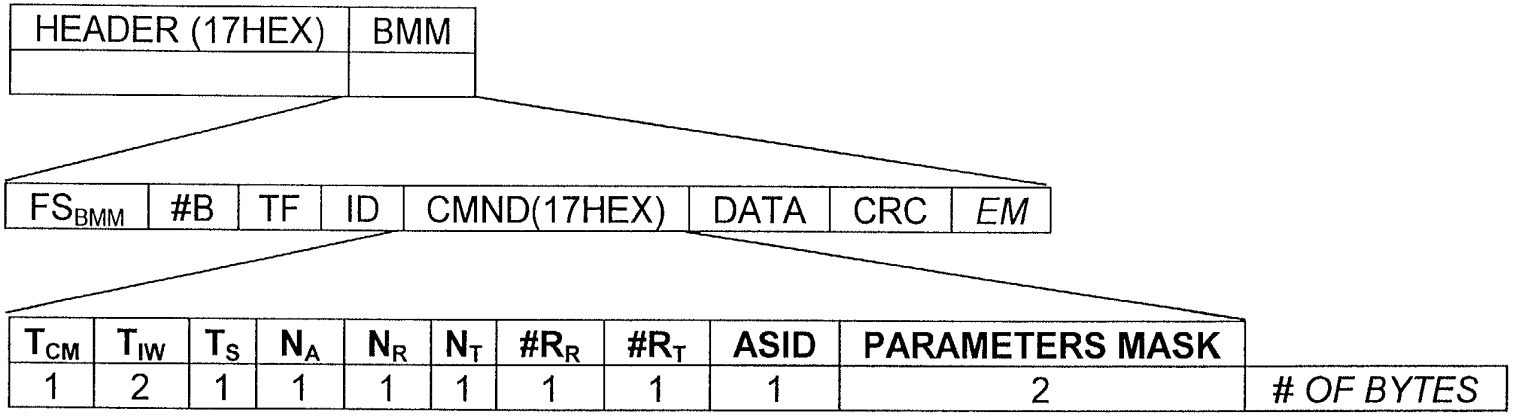

HEADER (17HEX)
BMM
FS BMM
#B
TF
ID
CMND(17HEX)
DATA
CRC
EM
T CM
T IW
T S
N A
N R
N T
#R R
#R T
ASID
PARAMETERS MASK
1
2
1
1
1
1
1
1
1
2
OF BYTES

FIG. 54

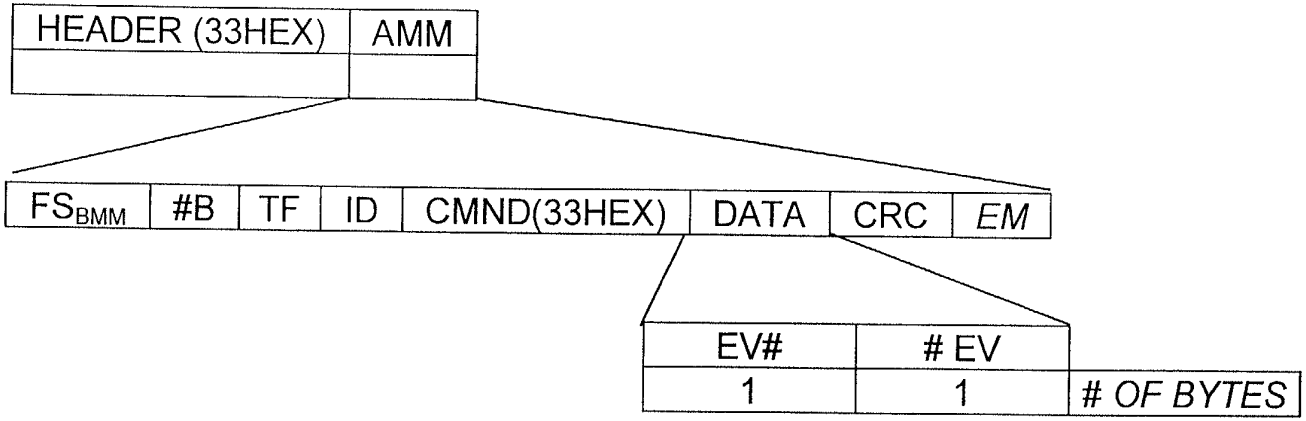

HEADER (33HEX)
AMM
FS$_{BMM}$
#B
TF
ID
CMND(33HEX)
DATA
CRC
EM
EV#
EV
1
1
OF BYTES

FIG. 55A

#	**MESSAGE TYPE MSGT**	**CODE**
1	VERIFY RESPONSE	10H
2	TAMPER RESPONSE	11H
3	SET RESPONSE	18H
3A	SUSPENDED SET	19H
3B	SOFT SET	1AH
4	READ DATA RESPONSE	32H
5	WRITE DATA RESPONSE	40H
6	ASSIGN SLOTS RESPONSE	50H
7	CLEAR ASSIGNMENT RESPONSE	51H
8	DEEP SLEEP RESPONSE	60H
9	HARD WAKEUP RESPONSE	61H
10	AUTO SET& WAKEUP RESPONSE	21H
11	RESET DATA BLOCK RESPONSE	2AH
12	START ALERT RESPONSE	70H
13	STOP ALERT RESPONSE	72H
13A	ACKNOWLEDGE ALERT RESPONSE	73H
14	START ALERT UNSYNCHRONIZED RESPONSE	38H
15	STOP ALERT UNSYNCHRONIZED RESPONSE	39H
15A	ACK ALERT UNSYNCHRONIZED RESPONSE	76H

FIG. 55B

#	**MESSAGE TYPE MSGT**	**CODE**	**COMMENTS**
16	UNSYNC. ALERT MESSAGE	77H	THIS MESSAGE IS GENERATED ONCE THE TAG DETECTS AN ALERT AND IS IN ALERT UNSYNCHRONIZED MODE.
17	LONG VERIFY RESPONSE	12H	
18	SYNC VERIFY RESPONSE	13H	
19	FILTER RESPONSE	14H	
20	START BURST MODE RESPONSE	15H	
21	HARD VERIFY RESPONSE	16H	
21 A	TRACK RESPONSE	1DH	
22	ACKNOWLEDGE RESPONSE	74H	
23	ADDRESSED VERIFY RESPONSE	17H	
24	ADDRESSED READ EVENTS RESPONSE	33H	
25	READ PARAMETERS RESPONSE	24H	
26	WRITE PARAMETERS RESPONSE	41H	
27	RESET STATUS RESPONSE	43H	
28	LOCK RESPONSE	85H	

FIG. 56

EVENTS	EVENT CODE
SET	01H
SEAL TAMPERED/ RESISTANCE CHANGED	02H
LOW BATTERY WARNING	03H
SEAL OPEN OR CUT	04H
SEAL CLOSE	05H
SOFT SET	07H
RTC STOPPED	08H
DATABASE CORRUPTED	09H
READ	0AH
TIME CHANGED	0BH
LIFE COUNTER IS EQUAL TO 0	0CH

FIG. 57

7	6	5	4	3-2	1-0
SET/ TAMPER	LOW BATTERY	$INPUT_0$	SUS_SET	MODE	MODE CODE

FIG. 58

BYTE# / BIT#	7	6	5	4	3	2	1	0
0	0	MINUTES / 10			MINUTES % 10			
1	MONTH %4		HOURS/10		HOURS % 10			
2	MONTH / 4		DAYS/10		DAYS % 10			
3	YEARS / 10				YEARS % 10			

FIG. 59

7	6	5	4	3-2	1-0	7	6	5	4	3	2	1	0
SET/ TAMPER	LOW BATTERY	INPUT$_0$	SUS_SET	MODE	MODE CODE	HARDWARE ERR	DBERROR	RTCERR	EVENT COUNTER 0	SLEEP MODE	BURST MODE	BUFFERFUL	COMMAND ERR

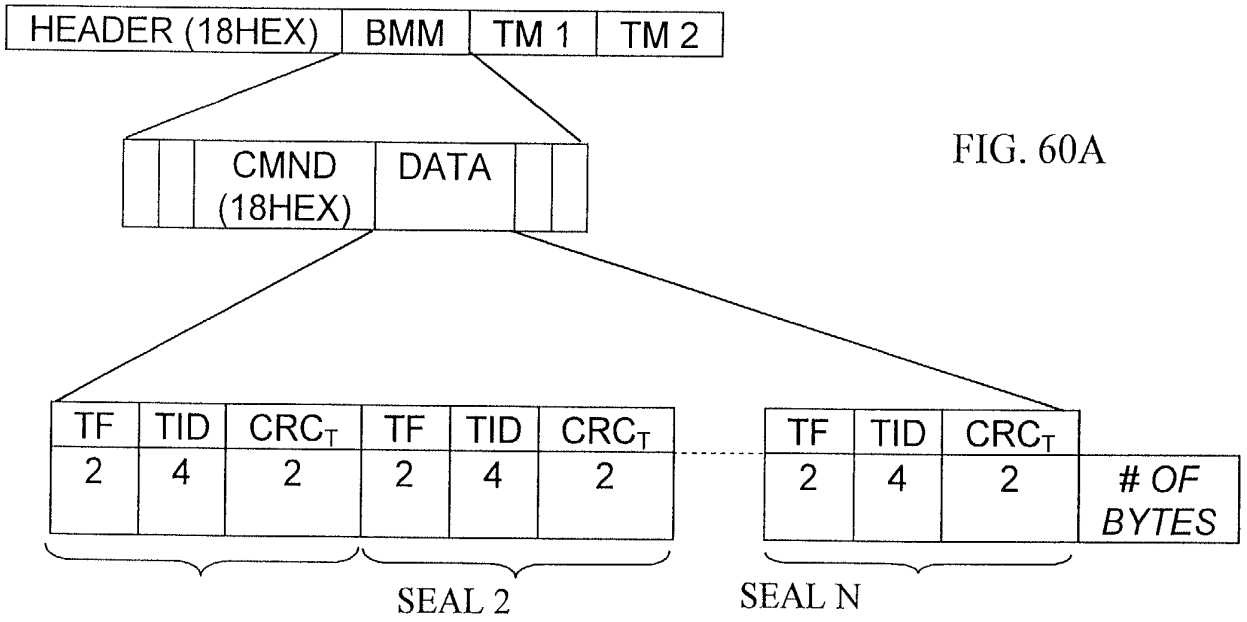

HEADER (18HEX)
BMM
TM 1
TM 2
CMND (18HEX)
DATA
TF
TID
CRC$_T$
TF
TID
CRC$_T$
TF
TID
CRC$_T$
2
4
2
2
4
2
2
4
2
OF BYTES
SEAL 2
SEAL N

FIG. 60A

FIG. 60B

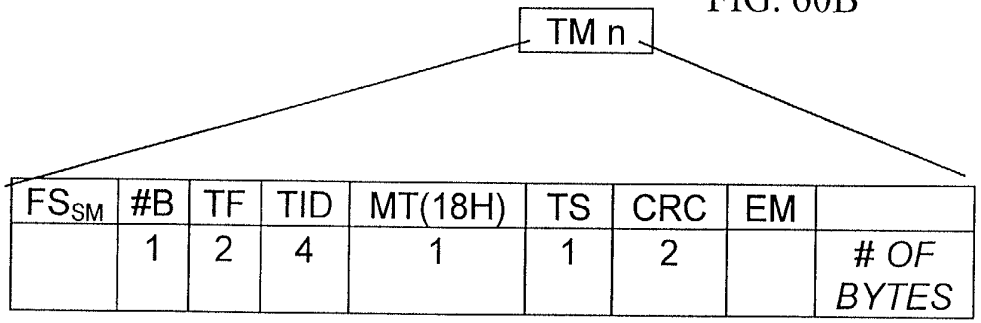


FIG. 61A

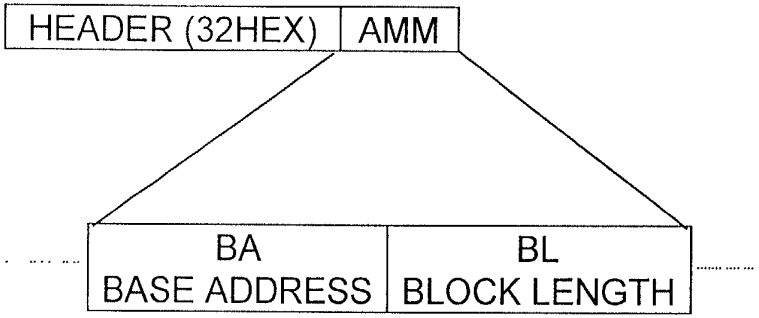


FIG. 61B

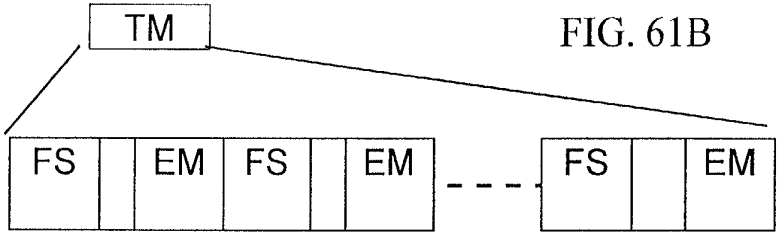


FIG. 62

FS	#B	TF	TID	MT(32H)	TS	P#/P	DATA	CRC	EM	
	1	2	4	1	1	1	N	2		*# OF BYTES*

FS	#B	TF	TID	MT(32H)	TS	P#/PK	DATA	CRC	EM	
	1	2	4	1	1	1	N	2		*# OF BYTES*

FIG. 63

FS	#B	TF	TID	MT(B2H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 64A

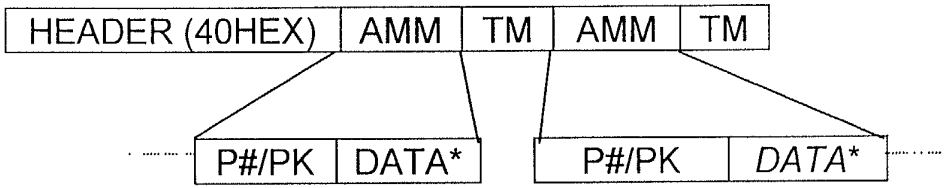


FIG. 64B

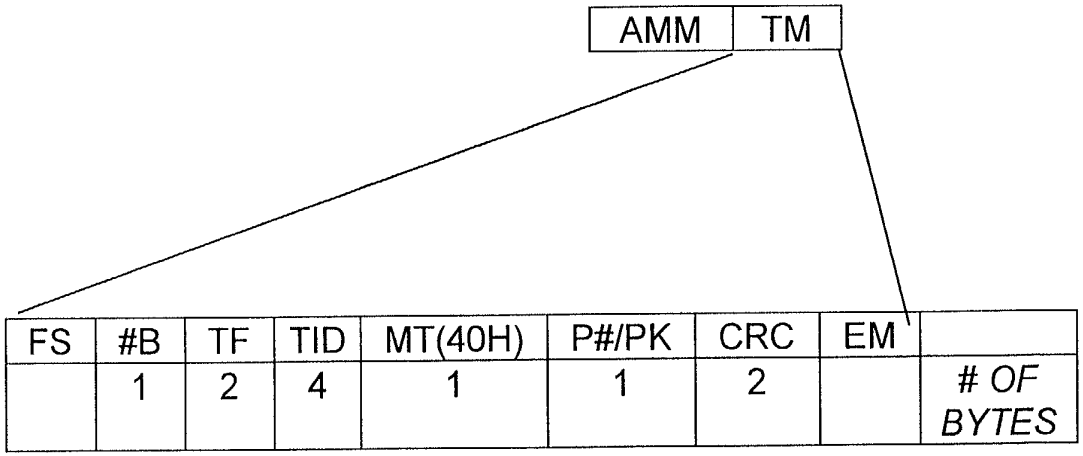


FIG. 65

FS	#B	TF	TID	MT(C0H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

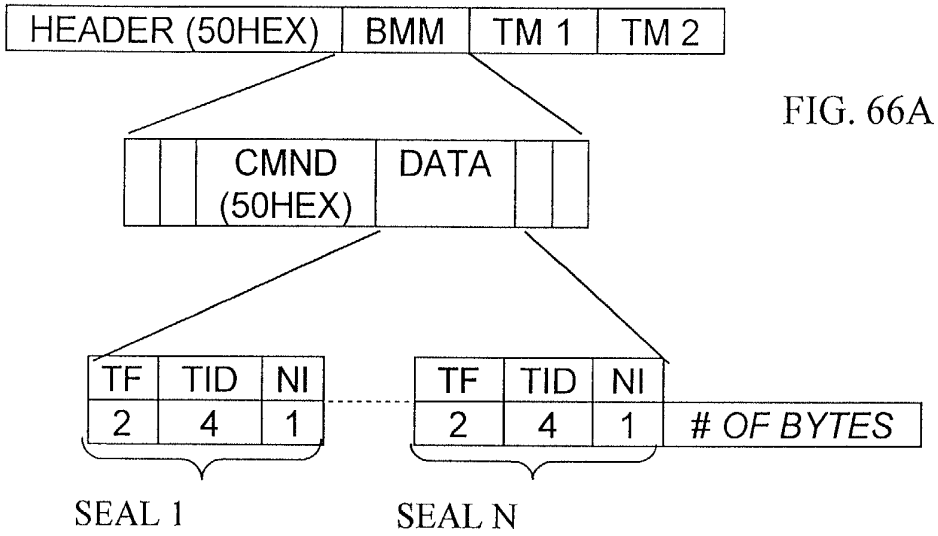


FIG. 66A

FIG. 66B

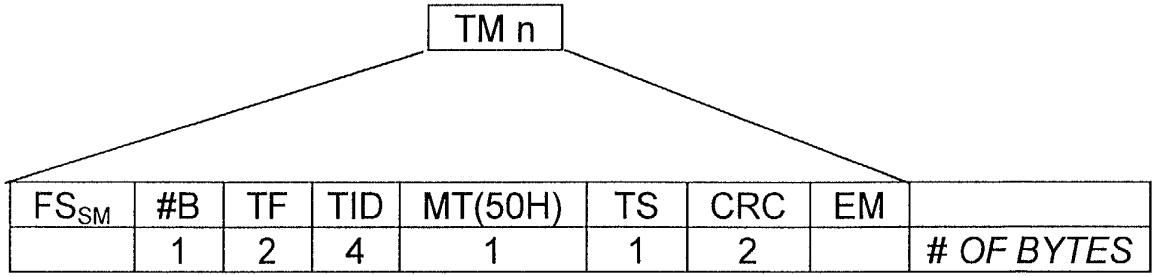


FIG. 67

FS_{SM}	#B	TF	TID	MT(51H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 68

FS_{SM}	#B	TF	TID	MT(60H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 69

FS_{SM}	#B	TF	TID	MT(61H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 70

FS_{SM}	#B	TF	TID	MT(2AH)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 71

FS_{SM}	#B	TF	TID	MT(70H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 72

FS_{SM}	#B	TF	TID	MT(72H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 73

FS_{SM}	#B	TF	TID	MT(73H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 74

FS_{SM}	#B	TF	TID	MT(38H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 75

FS_{SM}	#B	TF	TID	MT(39H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 76

FS_{SM}	#B	TF	TID	MT(76H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 77

FS_{SM}	#B	TF	TID	MT(77H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 78

FS_{SM}	#B	TF	TID	MT(43H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 79

FS_{SM}	#B	TF	TID	MT(41H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 80

FS_{SM}	#B	TF	TID	MT(85H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 81

FS_{SM}	#B	TF	TID	MT(19H)	TS	CRC	EM	
	1	2	4	1	1	2		*# OF BYTES*

FIG. 82

FS_{SM}	#B	TF	TID	MT(33)	EV#	EVENT CODE	D&T	RES	RND	CHKSUM	EM	
	1	2	4	1	1	1	4	1	1	1		*# OF BYTES*

FIG. 83A

FS SM	#B	TF	TID	MT(33)	EV#	EVENT CODE	D&T	RES	RND	CHSUM	EM	
	1	2	4	1	1	1	4	1	1	1		*# OF BYTES*

FIG. 83B

FS_{SM}	#B	TF	TID	MT(33)	EV#	EVENT CODE*	RID	**	CHSUM	EM	
	1	2	4	1	1	1	4	2	1		*# OF BYTES*

FIG. 84

EVENT	**EVENT CODE**	**MSB**	**LSB**
SET	0X01	Ø	Ø
SOFT SET	0X07	Ø	Ø
READ	0X0A	Ø	Ø
TIME CHANGED	0X0B	DELTA	Ø